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WORLD PETROLEUM

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PETROLEUM

The Danger of Irak

THOSE who are fortunate enough to own a copy of the first issue of WORLD PETROLEUM will recall the excellent article by Dr. Richard Lewinsohn, entitled—"Irak and the Myth of Mosul Oil," written for this journal following his visit to the "oil fields" of Irak, which are located about 400 miles from the prolific oil fields of Persia at Masjid-i-Suleiman. As will be gleaned from a cabled account from Dr. Lewinsohn in our last number, King Feisal of Irak is tired of the delays of the existing concessionaires in producing oil in commercial quantities, and prompted by French-British interests, is leaving no stone unturned to bring about active production and to pipe oil to the Mediterranean. Sufficient reserves have not yet been proved to warrant the construction of a costly pipeline, tank farms and sea terminals, although current rumors are that orders for equipment running to $75,000,000 are pending for German and British firms. Even were large supplies of oils almost immediately available in Irak their exportation is highly undesirable at this stage of the international oil industry when leading producing companies of every country, excepting Russia, are striving to effect a universal curtailment policy to the point where supply shall no longer exceed the demand. To drill for proving future reserves is commendable, but to open wide a new field of large potential capacity must have a profoundly disturbing effect on the entire industry, and might render unavailing such measures of conservation as already have been attempted.

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Price War Losses

CONSUMPTION of gasoline in the United States during the first six months of 1930 exceeded that of the corresponding period in the preceding year by nearly 10 per cent. In view of the shrinkage in volume recorded by almost all lines of business this is a very satisfactory showing. On the other hand reports of 24 leading American oil companies for the half year ending June 30 show a drop of 30.6 per cent, or $25,102,461, in earnings. This is clear evidence that cost reductions have not kept pace with the cut in prices. So far as the decline in net income represents a cut in the operating margin to maintain sales it probably reflects a sound business policy under conditions that now prevail. To an extent, however, the loss in earnings probably has been due to the gasoline price wars that have been carried on intermittently during the current year in various parts of the country. The most spectacular of these was waged in California and lasted for four months, but there have been numerous others. Without attempting to go into the merits of these conflicts it is noteworthy that in many cases they are started by local organizations with limited systems of distribution. While the action of the larger companies in meeting a challenge of this sort whenever it is offered is perfectly understandable the practical wisdom of such a course is questionable. A great company with a reputation to support must depend for success in the long run, not upon the cheapness of its product but upon its quality and the grade of service rendered. Such a company has more to gain by educating the public to recognize that the names and symbols behind its goods represent dependability and uniform excellence than by indulging in cutthroat competition. A steadily growing number of motorists have learned that in the purchase of gas and oil other factors are more important than a difference of a few cents in the cost of filling their tanks. As in other lines of industry there are sound reasons for more than one standard of product and price, and it is up to the companies supplying the higher grades to impress upon the minds of motor car owners and other purchasers exactly what their names behind the products mean. In view of this condition it is somewhat surprising that a fresh outbreak of price-cutting at gas-stations has been initiated in the New York City district at the time of writing by one of the major companies operating in the eastern states.

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Venezuelan Reglamento

UNDER the able guidance of the Jefe, Juan Vte Gomez, who is an outstanding figure among the public men in South America, and who also is blessed with very excellent common sense, rather than a political mind, the oil affairs of the Venezuelan nation have proceeded along exceptionally smooth lines undisturbed by the difficulties and obstacles that have retarded advancement in several other countries. Not only has this co-operative attitude been maintained by Dr. J. B. Perez, the present President of Venezuela, but it has resulted in an economic situation beneficial to both

Venezuela and to the oil companies operating in Maracaibo and other oil fields, but in a few years has made that country the World's greatest exporter of petroleum and second in production only to the United States. Of such vast importance has oil become that the government naturally desires to guard and conserve this great national asset. After a careful study of oil laws in various states and countries the Ministry of Fomento, which has charge of all mineral developments, has just issued as an administrative precaution new regulations of the 1928 law. As may be expected the future has been borne in mind when drafting the different clauses, with the result that the reglamento as a whole is very exacting and if immediately enforced to the strict letter of the law would impose a heavy burden on those oil companies, who during the last few years, have made very heavy financial investments as part of their development work.

To those who can read between the lines, however, it is evident that it is not the desire of the Venezuelan authorities to render oil operations difficult or too expensive for those companies who have done so much to help improve labor, living and economic conditions; but rather to organize proper control, especially over expansions of present activities. No doubt the technical officials of the Ministry of Fomento are just as desirous as the oil companies to plan the most satisfactory functioning of the regulations, and will shortly study the problems, and probably will "iron out" or modify, or perhaps even suspend pro-tem, any points that the particular operating conditions in Venezuela may render undesirable to enforce at this time, and so bring matters to a position in complete harmony with the administration of recent years. Jefe Gomez has consistently shown the wisdom emanating from a broad vision, and presumably neither President Perez or Minister Torres will depart from a policy which has proved so successful in the past. The country has no internal or external debt, and in celebration of the centennial this year there will be commenced a program of additional public works that will further advance national conditions, and aid the movements of international oil companies in their production work. The new oil regulations are discussed in this issue of WORLD PETROLEUM from the Venezuelan viewpoint especially written in Caracas for this journal.

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Gasoline Pipe Lines

ELSEWHERE in this issue is portrayed a comprehensive picture of recent developments in gasoline pipe-line transportation in the United States. What has lately been done, and what is being carried out or projected is of deep interest to oil men everywhere as tremendous developments may be expected within a few years. But what is commercially economical for America is not necessarily sound business for other countries, and cannot be ascertained until the various local factors are exhaustively studied following experience with lines now under construction in the States. Comparatively, European oil companies are enjoying low cost petroleum transportation and it is a question whether or not pipe lines are justified except in a few instances, such as in Russia. On the other hand construction and maintenance costs will be lower. In America the building of gasoline pipe-lines must have its effect on railroad revenues, but it is up to the railroad executives to foresee future requirements and as common interstate carriers construct such lines, charters permitting parallel with their tracks. In the same way they must offset losses in coal-carrying revenues caused by gas line growth and build power-plants at their mines.

International Oil Trade

OUTGOING petroleum trade of the United States with other countries for the first seven months of this year exceeded the incoming trade by over twenty-six million barrels. The most significant fact about this is that the exports, being mostly refined products, had a much greater value per barrel than the imports, so the balance of trade is greatly in favor of American oil companies, who incidently are also profiting by the imports as the crude is obtained at lower cost than in the States. It is true that American branches of a few foreign oil companies importing crudes and gasoline also benefit to a minor extent, but the American public is heavily interested in their stock and securities. The fact remains that America's refined oil business abroad is so important that anything calculated to disturb it is fraught with danger. An import tariff on petroleums would rapidly bring about an increase in the number of refineries in other countries, divert the incoming crudes, and seriously jeopardize exports of refined products. Even the existing world-wide business conditions have had their effect on imports and exports so far this year, favoring the U. S. A. Compared with the first seven months of 1929 there has been a drop of imports of crudes and refined products of 1,589,000 bbl., and a gain in exports of 3,001,000 bbl.

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Babson on Advertising

DIRECTLY reversing his recommendation of two years ago Roger W. Babson now strongly advocates additional expenditures in advertising as one of four important factors to bring about better business. "In fact," says Mr. Babson, "of the four concrete suggestions perhaps advertising is the most important of all. I wish to go on record today, as definitely advising all clients to increase their advertising appropriations and to use newspapers, magazines, etc. Whatever policy is followed by American business the balance of 1930 must show an improvement. But, what is to happen in 1931 will be largely determined by the policy of American business to the four recommendations, namely: reduce overhead; give better measure; increase research work, advertise more. Reducing wages or discharging employes will not cause money to circulate, nor will operating obsolete machinery. "Advertising, today," continued Mr. Babson, "is performing a very valuable and economic function, and more advertising now can render a great and needed service in speeding up the circulation of money. All business men can help themselves and help the country as a whole today by increasing their appropriations."

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Export Gasoline

LAST June WORLD PETROLEUM discussed the policy of the Export Petroleum Association, pointing out that while U. S. domestic prices are liable to make long swings, the Association's policy may defeat one of its own ends, namely, that of price stabilization. On maintaining the price of nine cents for over a year the Association has been faced with an increasing number of refineries in countries outside of the U. S., including the Caribbean where oils can be refined at a much lower cost than in America. WORLD PETROLEUM is no advocate of price cutting, but rather the establishment of prices consistent with current conditions. By the time this appears in print it is probable that the export price will be changed, as at a recent meeting a strong group of exporters advocated a price which would bring the export quotation in line with prices at which wholesale gasoline is being sold.

U. S. PRODUCTION REVIEW

Oklahoma: October.

THE Oklahoma City Pool continues to be the most important factor in the crude oil situation in the United States. The development has been extremely rapid, until today the field has about 500 producing and 300 drilling wells, with the potential production in excess of 2,000,000 bbl. per day. The present proration holds the daily production down to about 100,000 bbl., the official allowance being 5½ per cent, with a very large number of wells shut in entirely for the 65 day period after completion. Oklahoma City pool presents many difficult problems. At this time the Julian Oil Company (having but three wells) is threatening the proration by challenging the power of the Corporation Commission. To date proration in Mid-Continent has been primarily the result of gentlemen's agreement, with the Corporation Commission merely subscribing as a matter of form, and the questioning of the power of the Commission at this time is most unfortunate. Also the method of proration has been extremely harmful. The Arbuckle Lime-Stone production covering the central portion of the field, with about 80 wells, has been entirely ruined, while the most important Simpson Sand horizons are being rapidly depleted of their gas, thus necessitating gas lift and pumping in the not very distant future.

Proration of the pool is carried out by opening wells wide for 15 hours each 12 days, thus releasing huge amounts of gas, instead of the generally accepted method of producing the wells through small diameter tubing. While the original estimates for total reserves in Oklahoma City pool have been up to 1,000,000,000 bbl. the present concensus of opinion is that even 330,000,000 bbl. is entirely too optimistic. There is hardly any doubt that more sensible prorating would have greatly increased the total recovery, not mentioning the fact that the gas lift and pumping which will be resorted to in the future will be extremely costly, since the wells are very deep, in excess of 6,400 feet.

The pool is owned primarily by the Indian Territory Illuminating Oil Company, which however, by no means controls it. The Sinclair Oil and Gas Company is the second largest producer in the field, with the T. B. Slick Oil Company following. With the producing cost of a well around $130,000, quite many wells will not pay for themselves, inasmuch as in the north end of the field, in the town lot area, as many as 50 wells are being operated, instead of the usual 16 on the quarter section (160 acres), thus increasing the normal drilling costs from $2,000,000 to $6,500,000. The Sinclair Oil and Gas Company will profit most from the Oklahoma City pool in proportion to the investment, because it owns about 400 acres of the very best acreage and also is not interested in the doubtful town lot area development campaign. The Indian Territory Illuminating Oil Company will show good profits after 3 or 4 years, but meanwhile its tied up investment in the field is extremely large. The total investment in the drilling of 800 wells has already exceeded $100,000,000 to date, while secondary expenses probably brought the development costs to $125,000,000. A total of about 30,000,000 bbl. has so far been recovered with a value to the oil companies (deducting 1/8 royalty) of about $35,000,000, with I. T. I. Oil Company accounting for about 1/3 of the total.

Active development of the Oklahoma City pool will end by December 1st of the current year. The field is well defined even at this time and by 1931 the pool will be fully developed and will take its place in Oklahoma as compensating the production of the rapidly declining Greater Seminole area.

Greater Seminole

GREATER SEMINOLE oil area, which includes, about a dozen fields in Seminole and Pottawatomie Counties, has definitely passed out of the picture as far as the discovery of new major pools is concerned. Few very small fields are yet to be opened, but their production will be not sufficient even to hold the total production of the Seminole area from showing very considerable declines. During the last year two minor fields were opened in shallow horizons, which though showing large flush production will decline very rapidly during the coming year. During the first six months of 1930 the production has declined from about 340,000 bbl. per day to less than 300,000 bbl.

B. ZAVOICO.

[The new monthly feature will be extended to include a resume of all the major oil fields of the United States.—*Editor.*]

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World Crude Production For August, 1930

	Bbl.
U. S. A. (A. P. I.)	76,598,000
Venezuela (estimate)	11,550,000
Russia (estimate)	11,200,000
Roumania (estimate)	3,990,000
Persia (private)*	3,413,300
Mexico (official)	3,448,543
Neth. E. Indies (estimate)	3,250,000
Colombia (private)	1,747,202
Peru (estimate)	1,000,000
Trinidad (official)	793,666
Egypt (estimate)	151,627
Ecuador (official)	137,642
Canada (private)	99,423
Poland (official)	57,600
Sarawak (official)	51,812

* July official, 3,841,600 bbl.

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Finance

(Continued from page 427)

U. S. Steel will deliver 64,992 shares of its common stock and either $6,865,800 in cash or an equivalent amount in its common stock in addition to the shares just mentioned. It is reported that the officers and personnel of Oil Well Supply will be retained to run the business, which will probably be operated as a new subsidiary of U. S. Steel.

SIX months consolidated earnings statement of Sinclair Consolidated Oil Corporation revealed balance for common stock equal to 49 cents per share, excluding the 700,000 shares issued on June 30 to Pierce Petroleum in exchange for its assets. This compares with $1.02 per share earned in the first half of 1929. Requirements of the current $2 annual dividend rate were thus only about half met and it would appear that continued disbursements at the old rate must be made in good part from surplus.

FINAL argument in the Government's suit to prevent merger of Standard Oil of New York and Vacuum has been set for October 6 and 7, but it is not considered likely that a decision will be reached before the end of the year.

C. C. BAILEY.

FINANCE

London

DEALERS in the London oil share market are still wondering what was the real cause of the sharp price fluctuations of the past few weeks. Up to the closing weeks of August oil shares had shown strong resistance to the general depression of the London Stock Market. They then suddenly participated in a fresh downward move in all sections, but have responded to the subsequent general recovery, although they are still distinctly lower than they were a few weeks ago. London has had to absorb a good deal of realization of oil shares from Continental quarters, and some of the leaders were also sold by operators in this country to provide funds for meeting losses in other directions. These factors undoubtedly account for part of the decline, but the rapidity of the later advance suggests bear covering on a considerable scale. The passing of the Shell Union dividend was undoubtedly a powerful influence making for lower prices. American petroleum statistics have been moderately encouraging, and have probably assisted in the recovery. The tendency of the market is now uncertain, little encouragement being derived from the advance in Pennsylvania crude, or from the price adjustments of the Standard Oil Company of California.

AN important market factor was the statement issued by the directors of the Royal Dutch Petroleum Company, following the decline in the price of the shares of the company and its associates when the Shell Union quarterly dividend was passed. The Royal Dutch directors stated that nothing had occurred to shake their confidence in regard to the immediate future. Greatest caution in the matter of finance has always characterized the policy of the Royal Dutch-Shell group, the large depreciation allowances shown in the accounts of the Shell Union itself being cited as an example.

TO provide funds for the extended drilling programme of the Dacia Romano Petroleum Company, the directors are proposing to issue a further 315,000 shares of 4s. each. This issue will bring the capital up to the full authorized amount of £350,000. The directors report that immediately after the capital reconstruction in July, 1929, when the nominal value of the shares was reduced from £1 to 4s. each, arrangements were made for drilling the company's property at Piscuri. Six wells have been drilled with satisfactory results, while the board hopes for better results from deeper drilling. The refinery capacity is now about 8,000 tons per month, but steps are to be taken to increase the same activities in this direction. This concern has never paid a dividend.

TRINIDAD LEASEHOLDS has gone into the gasoline distributing business by purchasing a branch of Burt, Boulton and Haywood. The company intends to market its own brand of gasoline in Great Britain, and the Stock Exchange inferred from the statement that its marketing arrangements have undergone a radical change. Although the issued capital of Trinidad Leaseholds is £1,311,-562, it is a small concern in relation to the Anglo-Persian, Shell and other big vendors of oil on the British market, and that the competition which it will have to meet will be of the keenest. This aspect is an important one, but the company is in a very sound financial position, with large cash resources, and is associated with Central Mining and Investment Corporation, originally a South African and now an almost world-wide finance company.

A. H. DAY

London Stock Exchange Prices

1930 High	1930 Low	Last Year's Div. % per Ann.	Share	August 5 to September 15 First	High	Low	Last	Change
1 3/16	3/8	3½	Anglo-Ecuadorian	5/8	5/8	3/8	3/8	— 1/16
2 5/8	2	22½	Anglo-Egyptian "B"	2 3/16	2¼	2⅛	2 3/16	— 1/16
4 3/8	3	20	Anglo-Persian	4 1/16	4 1/16	3 5/8†	3 5/8†	— 3/8
1 3/8	7/8	52½	Apex Trinidad (5s.)	1/2	1/2	3/8	3/8	— 1/16
2	7/8	....	Attock	1¼	1⅝	1 1/16	1¼	.....
5/8	5/8	12½	Brit. Borneo (10s.)	7/16	7/16	5/8	3/8	— 1/16
1/4	1/16	7½*	Brit. Burmah. (8s.)	1/4	1/4	1/16	1/16	— 1/16
1/4	1/16	....	Brit. Controlled (85)	1/8	1/8	1/16	1/16	— 1/16
5/8	1/16	....	Do. Prefd. (85)	1/8	1/8	1/16	1/16	— 1/16
4 3/8	3 3/8	30	Burmah	4 1/16	4 1/16	3⅞	4 1/16	— 1/16
1/2	1/16	12c	Canadian Eagle (No par)	3/8	3/8	1/16	3/8	— 1/16
1½	1 1/16	....	Creole Petrol. (No par)	1 1/16	1 1/16	1 1/16	1 1/16	— 1/16
1/16	1/16	....	Kern River (10s.)	1/16	1/16	1/16	1/16	.....
2 3/8	1 3/8	12½	Lobitos	1⅝	1 3/8	1 3/8	1 3/8	— 1/16
3/4	1/2	6	Mexican Eagle ($4 Mex.)	5/8	5/8	1/2	1/2	— 1/16
68	51	....	Pan American "B" (850)	60½	61	55	56	—4½
1 3/8	3/8	5	Phoenix	3/8	3/8	3/8	1/16	— 1/16
35¼	28 1/16	24	Royal Dutch (100 fl.)	32½	32⅝	28 1/16	30⅜	—2⅛
4 3/8	4¼	25*	Shell Transport	4 3/8	4⅜	4¼	4 3/8	— 1/16
1/2	1/16	4	Steaua Romana	3/8	3/8	1/16	3/8	— 1/16
3⅞	1 1/8	30	Trinidad Leasehold	2 3/8	2 3/8	1 1/8	2 1/16	— ⅛
3/8	1/16	....	Utd. Brit. of Trinidad (6s. 8d.)	1/16	1/16	1/16	1/16	.....
3 1/16	1 3/8	20	Venezuelan Oil Concessions	2 1/16	2 1/16	1 3/8	1⅞	— 1/8

Nominal value of shares £1 unless otherwise indicated by bracketed figures.
* Denotes tax-free dividend. † Denotes "ex-dividend" price. c—Denotes cents per share.

Paris

NEGOTIATION between the French State and a Roumanian Commercial Delegation, presided over by Dr. E. Ene, Secretary to the Ministry of Commerce, now appear to be taking a satisfactory turn for all concerned. From the Roumanian point of view exportations of oil to France are the most important item on the program and Dr Ene has been striving to obtain the French Government's consent to import greater quantities in proportion to increased consumption. During 1929 1,251,971 bbl. were imported and the Delegation hopes to increase this total until 2,800,-000 bbl. are attained.

Other important events worth mentioning are: the decision of the shareholders of the Compagnie Française des Pétro les to increase the companies Capital from 150,000,000 francs to 600,-000,000 francs, and the Liquidation of the S. A. DABROWA.

One of the difficulties of the C. F. P. that will have to be overcome is the division of A shares carrying 20 votes and B shares carrying only one vote. Any concern actually absorbed by the

C. F. P. naturally has the right to claim shares of both categories in exchange for its assets, but recent legislation has abolished the right to issue new shares carrying more than one vote; the C. F. P. will therefore be obliged to issue B shares in blocks to the extent of Frs. 600,000,000 in order to equalize the number of votes, to a certain extent, and to put new companies entering the C. F. P. on the same footing as the previous shareholders. The near future will probably reveal with which companies the C. F. P. has been negotiating. The States participation of 25 per cent in the C. F. P.'s new issue has been assured—provided of course that the Chambers ratify the Agreements of 1924 and 1929.

THE CREDIT GENERAL DES PETROLES is absorbing the assets and liabilities of the S. A. DABROWA by effecting an exchange of shares. 374,000 DABROWA shares will be taken over at the rate of 5 to 1. Thus yet another chapter in the book of French oil companies is closed. The S. A. DABROWA was one of the most powerful French companies operating in Poland.

E. J. ANDRE

New York: October

STOCK market activity has been only slightly greater than reported last month, but the general tone has been stronger and some advance in the averages has been recorded. In recognition of the importance of the various curtailment measures in force in the important crude producing states, the recent litigation involving the validity of Oklahoma's proration law was intently watched. Upholding of the law has lent renewed faith that curtailment will not break down in the near future at least. The industry is approaching its season of slackening demand, and with gasoline stocks continuing to run at levels which seem unnecessarily high there appears little prospect of impressive advances in oil shares this fall, apart from such sympathetic strength as might be imparted from a sustained upward movement in other departments of the list as a result of definite recovery in general business.

DUE largely to operation this year of its new refinery on Aruba, D. W. I., Pan American Petroleum & Transport reported a substantial gain in profits for the first six months over the same period of 1929. Net before Federal taxes was $7,988,361, more than double the $3,985,719 reported for the first half of last year. Expansion of marketing facilities in the Eastern part of this country and in South America was of aid in translating operations at the new refinery into net profits for the company.

SUBJECT only to ratification by stockholders of Independent Oil & Gas, which is expected at an early date, the company will be acquired by Phillips Petroleum to form the largest oil company in the Mid-Continent district. Combined net assets after reserves will approximate $214,000,000 and activities will cover with little or no duplication the area from the Mississippi to the Rocky Mountains and from Texas to the southern limits of the states along the Canadian border.

ACCORDING to a tabulation which appeared in the WALL STREET JOURNAL, profits for 24 oil companies reporting for the six months ended June 30, 1930, revealed a decline of 30.6 per cent from the same period of 1929, although showing an increase over the first half of 1928 of 18.8 per cent. Nineteen twenty-nine is recognized as one of the most profitable years of the entire history of the oil industry and the indicated decline for the first half of 1930 reflects the less favorable conditions that have prevailed this year. There appears little indication of any material improvement in the current half year's results although 1930 is likely to compare favorably as a whole with 1928.

It is perhaps worthy of note that the compilation includes only one or two representatives of the so-called Standard Oil group, since most of the important companies in this group report earnings once a year only. While it is possible that the Standards have not suffered as large a percentage decline in net because they are in general a stronger, better integrated and better entrenched group, it is nevertheless to be expected that they are affected by the same unfavorable factors arising out of too great productive activity and keen competition.

ON or before September 30 assets and business of Oil Well Supply Company were to have been transferred to United States Steel Corporation in accordance with an agreement recently approved at a special meeting of Oil Well Supply stockholders. Stockholders voted to change its name to Pittsburgh United Corporation, but no intimation has been given as to probable disposition of assets which will be received from U. S. Steel in exchange for its former properties and business.

(Continued on page 429)

New York Stock Prices

1930 High	1930 Low	Current Div. $ per Annum	Stock (Par Value $)	August 18 to September 13 Sales (Shares)	First	High	Low	Last	Net Change[1]
51⅝	30⅛	†2.00	Atlantic Refining (25)	55,600	37½	37⅝	33⅛	34¼	— 2⅞
34	20½	2.00	Barnsdall A (25)	40,600	23½	23⅞	21⅝	22½	— ⅝
8⅛	3⅛	....	Colon Oil (No)	3,700	3⅞	4	3⅝	3⅝	— ⅛
30½	18⅝	....	Continental Oil (No)	69,200	20¼	20⅝	18½	19⅜	— 1⅝
7⅝	5¼	....	Creole Petroleum (No)	23,500	5⅞	5⅞	5¼	5⅛	— ⅜
166⅞	115½	1.50	Gulf Oil Corp. (25)	9,400	121½	124⅞	118	120	— 2½
119	78	2.00	Humble Oil & Ref. (25)	8,000	86	93	85¼	88½	— 2½
30	18¼	0.50	Imperial Oil, Ltd. (No)	23,900	19½	23⅝	18⅝	23	+ 3¼
28⅜	8⅞	....	Indian Refining (10)	114,400	11¼	14	10⅝	14	+ 2½
24	17½	1.00	International Petr. (No)	25,100	18½	19⅝	17½	19¼	+ ¾
37	16⅛	....	Mexican Seaboard (No)	252,400	22¼	25½	21	24½	+ 2⅝
67½	50½	....	Pan Amer. P. & T., B (50)	5,900	58⅛	58⅛	53	54	— 4
44¾	28⅛	**2.00	Phillips Petr. (No)	158,400	32	34⅛	30⅝	33	+ ⅛
54	33⅜	2.00	Prairie Oil & Gas	8,600	35½	35½	33⅜	34½	— ½
27¼	19½	1.50	Pure Oil (25)	45,500	21	21⅛	19½	19⅜	— 1
28¼	14⅜	2.00	Richfield Oil (25)	107,700	16⅝	17⅛	14⅜	16⅞	+ ⅝
56½	45⅜	*3.20	Royal Dutch (N. Y.) (13⅓)	86,600	50⅜	50⅝	45⅜	48⅛	— 2⅝
25½	14	....	Shell Union (No)	90,600	15⅜	16⅜	14	14⅝	— 1½
32	20	2.00	Sinclair Consol. (No)	219,600	23⅞	23⅞	20	21½	— 2¼
42	26⅞	2.00	Skelly Oil (25)	23,300	28½	28⅞	26⅞	27	— 1½
75	55½	2.50	Standard Oil of Calif. (No)	39,400	62⅜	62½	60	60½	— 2⅛
59⅞	47⅜	2.50	Standard Oil (Ind.) (25)	83,500	49⅜	49⅞	48½	49⅜	— ⅛
40½	30⅛	1.60	Standard Oil (Ky.) (10)	10,300	31⅜	31⅝	30⅝	30⅛	— 1
84⅞	58	†2.00	Standard Oil (N. J.) (25)	464,400	70⅝	72⅛	67⅞	70	— 1⅝
40⅜	30	1.60	Standard Oil of N. Y. (25)	76,600	31½	31⅝	30½	30⅞	— ⅝
70	50	§1.00	Sun Oil (No)	1,300	57⅜	59½	57⅜	59⅛	+ 1⅛
60½	50⅛	3.00	Texas Corp. (25)	55,100	52⅝	52½	50⅝	52	— ⅞
17¾	10¾	0.60	Tide Water Assoc. (No)	39,000	14½	15	13	13	— 1½
50	37	‡2.00	Union Oil of Calif. (25)	13,100	41	41	39⅛	40	— ¼
97⅞	76¼	4.00	Vacuum Oil (25)	44,400	81⅞	81⅞	78	78	— 4
4½	2	....	Venezuelan Petr. (5)	4,700	2⅝	2⅝	2⅛	2¼	— ⅛

[1] Since close of last month's table. * Paid last year—no regular rate. ** Plus 5% in stock. † Including extras. ‡ Plus 4% in stock. § Plus 9% in stock.

SHIPPING

London: October

THE visit of Standard Oil (N. J.) officials to this side has now borne fruit, much to the joy of Continental shipbuilders and to the disappointment of British shipbuilders. Orders for nine tankers of about 16,000 tons deadweight apiece, and a speed of 12 knots have recently been placed. Six have gone to Germany and the remaining three to Italy. All are motor vessels. The principal reason for this order going to Continental yards is partly one of price and partly a reward to those Yards for the businesslike attitude which they are adopting towards obtaining new contracts from U. S. oil companies. It is understood, however, that the Continental yards have taken this further mass order for tankers at rather a low price. One account discussing the twin-screw Italian-built vessels which have gone to the Cantiere Navale Triestino, Monfalcone, and will have Fiat Diesels of 4,500 hp., mentions that they have been placed at about £13:10s. per deadweight ton. The new vessels will be very large ships and will have a loaded speed of from 12 to 12½ knots. The contract calls for the delivery of the first ship in about 17 months, the second in about 23 months and the third in 34 months. The six vessels which are to come from German yards are similar vessels. Two are to be built at the Krupp Yard and fitted with Krupp engines, two will be constructed by the Deutsche Werft, and two by the Bremer-Vulkan Yard, these latter four ships having twin double-acting 2-cycle M. A. N. Diesels. This Standard Oil mass order is the third large mass order for tankers this year, the biggest having been, of course, the Anglo-Saxon to which attention was called in these notes recently, the next one the British Tanker Company's orders and now this third one mentioned above.

THE Standard Oil Company, through the Standard Shipping Co., is also asking tenders for two 13,000-ton tankers while among new work is a motor tanker of 12,800 tons deadweight capacity recently placed with the Kockums Yard Malino by a Stavanger owner. This ship is to be handed over on July 1st, 1932, and is already fixed for a 10-year time charter at 6/5½d. per ton. While, therefore, the present state of the charter market may have shown a slight slackening off in orders placed for tonnage of the charter type, it is very evident that there is no falling off in tanker orders generally. It is a significant fact that the big tanker-owing companies are now coming into the field with these large orders after having kept out of the constructional market for some time. Many people consider that they held off building for too long and suddenly awoke to the fact that they might be placing themselves very awkwardly in the hands of the chartering owners. Particularly significant was a conference held fairly recently at the Hague between all owners of charter tanker tonnage. Concerted action on the part of these owners might easily have placed the big oil companies in an awkward position. Having once realized this possibility, they have with the immense financial resources at their call, been able to turn very quickly any "tables" which might have existed in the matter. In fact the Standard Oil is reported to be in the market for three additional tankers, and enquiries one on foot for a 14,000 tonner for the Pan-American Petroleum (S. O. of Ind.).

ONE of the next contracts likely to be placed in this country is for one or probably two small tankers which are to be sister ships to the RUSOILPROD illustrated in these pages in the July issue. Esplen Sons & Swainston, the well-known Consulting Naval Architects, are now busy working on these designs and there is a chance that the new ships when placed will emulate U. S. coastal practice by being Diesel-electric. There is quite a wave of feeling towards Diesel electricity sweping over this country at the present time, and as has been foreshadowed in these columns at least one big tanker builder is beginning to consider the possibility of a mass production of Diesel-electric power plant for tankers. Thus it will be seen that the general situation, although perhaps rather disappointing from the point of view of British shipbuilders is, viewed from a world standpoint, quite good.

Completions:

DURING the last few weeks there has been extreme activity with the completions and launchings of new tankers. In the first category one can mention twelve large motor ships of between 8,000 and 13,000 tons deadweight, all completed within the last week or two. Of these ten have been completed in British yards, one in Germany and one in Sweden. Nine are for Scandinavian owners, one is for a German owner and two for British owners. The motor tanker is beginning to sweep all before it. The fact that several tankers building in American yards are geared-turbine ships with high-pressure steam, does not affect the world situation. In launchings the last few weeks have also shown considerable activity, there being eleven motor vessels put into the water.

Tanker Freeboards:

THE situation regarding tanker freeboards is at the moment by no means clear. While provisional suggestions were agreed to at the recent Conference in London, nothing has yet been ratified and owners ordering tonnage at present can only do so having in mind the possible way in which their new tonnage may be affected. Lloyd's do not seem to be in a position to give any definite information on the matter. Whether they are being purposely reticent on this matter, or whether Rules to meet the new freeboard regulations have not yet been evolved, does not seem to be certain. One thing seems to be definite, that heavier scantlings will be called for tank-hatch lids. The question of summer tanks is one which will require consideration, and there has also to be taken into consideration the case of those ships which have the usual expansion tanks but no summer tanks.

The new regulations will be enforced in the middle of next year in regard to maximum draft to which tankers will be allowed to load and new free board regulations. The subject is somewhat complicated, as although the International Conference has decided that the free board tankers can be reduced by an amount of 15%, this is all subject to the strength and scantling of vessels to be approved by the Classification Societies.

A. C. HARDY.

The Foreign Oil Legion

P. M. MISKELL, general-manager of the Empire Oil & Refining Company, returned from a European trip last week, visiting Great Britain, Ireland, France and Belgium.

▼

P. M. Miskell, gen'l mgr., Empire Oil & Refining Co.

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MARIANO MARFIL has been appointed to represent the Spanish government on the Spanish Oil Monoply with a view to carrying out reorganization where necessary. Doubt has been expressed in authoritative circles that it is intended for Signor Marfil to carry on negotiations with Standard Oil and Royal Dutch-Shell interests to turn over the monopoly in return for a loan of $100,000,000.

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E. G. SEUBERT, president of the Standard Oil Company of Indiana, and R. G. Stewart, president of its subsidiary, the Pan-American Petroleum and Transport Company, have both returned from their European business trip.

▼

RUSSELL PALMER, publisher of WORLD PETROLEUM, who has been in Europe, will be back in New York by the time these notes are published. Mr. Palmer also is publisher of PETROLEUM WORLD-OIL AGE of Los Angeles, and a number of other industrial journals.

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ROBERT HAGUE, who plays such a prominent part in the overseas and domestic marine oil transportation of the Standard Oil Company of N. J., has been awarded the Order of Knight Commander of the Crown of Italy by direction of the King of Italy. The order was recently conferred on Mr. Hague by the Italian Ambassador to Great Britain.

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ELLIS D. FRIGAR, pipe-line superintendent of the Lago Petroleum Corporation at Maracaibo, Venezuela, has just arrived in the U. S. A., via tanker.

▼

ROY NEWTON, field-superintendent of the Venezuela Gulf Oil Corporation at Maracaibo, is in the United States, having arrived on the ss. LARA.

▼

R. G. Stewart, president, Pan-American Petroleum & Transport Co.

▼

HOWARD SLATER has returned from Venezuela, having been appointed purchasing-agent in New York for the Venezuelan Gulf Oil Corporation. Until recently Mr. Slater was located at the Company's terminal at Maracaibo.

▼

ROGER W. JONES, advisory-engineer for absorption plants at Maracaibo for the C. F. Braun Company, has returned to Alhambra, California, following the completion of plants for the British Controlled Oil Fields, Ltd., and Lago Petroleum Corporation.

▼

CHAS. DABELL, field-manager, British Controlled Oil Fields, Ltd., El Mene, Venezuela, has left after three years service, and will take up a position in the Argentine after a visit to England.

W. R. FINNEY, engineer of the Pan-American Petroleum Corporation, has been in Maracaibo studying the Company's forthcoming electrification of its lake oil fields, and now is back in New York.

▼

G. ELDER, chief-engineer of the Venezuelan Gulf Oil Corporation at Maracaibo, is supervising the erection of the Company's new 5,000-10,000 kw. power station at Las Morochas.

▼

H. E. BRANDLI, general-manager of the Cities Service Export Oil Company returned recently from an extended trip through Europe, visiting France, Italy, Spain, England and Germany. Mr. Brandli makes these trips annually for the Cities Service Company's interests and reports conditions very much improved over there.

▼

G. W. HALSE has been appointed acting-manager at the El Mene, Venezuela, concessions of the British Controlled Oil Fields, Ltd.

▼

C. B. DE BRYN, who until recently was assistant-manager of the Astra-Romana, has been appointed managing-director of the Shell Chemical Company at San Francisco, Cal. Mr. de Bryn has been associated with the Rumanian oil industry for 20 years.

▼

WORLD PETROLEUM will be glad to receive, prior to the 15th of each month if possible, movements of oil company officials in all parts of the World.

E. G. Seubert, president, Standard Oil Company of Indiana.

Electrification of Maracaibo Oil Fields

Two Major Oil Companies Constructing Power Plants of 10,000 kw. Ultimate Capacity Each First Units Both will be of 5,000 kw. Electrical Drilling Program will be Limited at Outset . .

EVER since the prolific oil fields of Lake Maracaibo have been worked, power for drilling and pumping has been steam, using gas under the wells as fuel for the boilers. With all wells on the lake itself wooden or concrete piles are sunk and the boilers located on separate platforms at a safe distance from the wells, steam pipes being carried along a cat-walk. It is common practice to install three 50 hp. boilers between two wells.

When visiting the Venezuelan oil fields last year it was apparent to our editorial representative that Lake Maracaibo operations were ideally situated for electric power, particularly as this large inland sea nowhere is more than 50 ft. deep, and the subject was raised with oil officials. Several of the oil companies, however, have been studying the matter in collaboration with the electric concerns for nearly two years.

Work is already commenced on a power plant at Punta Gorda for the Lago Petroleum & Transport Corporation, which now is part of the Standard Oil of Indiana. The decision was made last fall following a thorough study by the engineers of the oil company in collaboration with the International General Electric Company's engineers. It was decided by the Lago company that they would erect the power-plant themselves and carry out the complete installation with the assistance of an outside engineering concern to do the design work, and that the concrete construction work necessary on land and in the lake would be done by a local American contracting firm. All materials are being purchased and all transportation of the same is carried out by the oil company itself, and actual construction started July 1st of this year.

In the preliminary plans made by Lago, Diesel engines were proposed for generating the power, and gas engines were also considered; but when the outside companies were called into consultation the consensus of opinion swung over to turbo-electric units using natural gas or the heavier grades of crude (for stand-by) under the boilers, on the ground that, taking all factors into consideration, the most economical results would be obtained with steam power. Furthermore, it would be showing proper consideration of the Venezuelan government's desire for oil companies to utilize all natural gas as far as possible, and to avoid its waste.

The installation now being erected consists of two 2,500 kw. turbo generators and space has been provided in the power house for an additional unit of 5,000 kw. A high-tension line is being erected along the lake from Ambrosio to Lagunillas, and this is a double-circuit, 33,000 kw. line. The entire installation as well as the sub-stations are designed for the full 10,000 kw. output.

At the outset, electric power will be used for pumping water, loading ships, pumping oil from the flow stations on the lake to the storage tanks on shore, power and lighting for the shops and camps, as well as for a limited program of oil-well pumping. The latter will have individual 5 hp. motor-driven jacks and portable motor-driven hoists on the derrick floor. There will be no electrical drilling for some time. Distribution of power over the lake will be by means of a combination overhead and submarine cable system, and current will be sent in two directions, namely, up and down the lake. There will be a complete system of evaporators for the make-up water, which also will be de-aerated. Salt water from the lake will be used and as the boiler installation will be of the fully-condensing type, little trouble is anticipated from the salt water from Lake Maracaibo. Water from the condensers is used for drinking purposes.

The Venezuelan Gulf Oil Corporation has also decided to electrify its concessions on the lake. These consist of a strip off the shore between those of the Lago Petroleum Company and the Royal Dutch Shell, the Lago field extending over the balance of the lake, which is about 50 miles wide. The plans in general, call for a 10,000 kw. power plant on the shore at Las Morochas, located midway between Lagunillas and Punta Gorda. The initial units will consist of two 2,500 kw. turbo-generators using gas or oil if desired, under the boilers, and a 5,000 kw. unit will be added when power demands make this necessary. The installation (Westinghouse) is very similar to that of Lago,

To house the power-plant a concrete building is being constructed. A high-tension line will be built over the water as far south as the Laguna section of Lagunillas, and as far north as the Ambrosio field; it will be approximately 65 kilometers long, parallel with the shore at about 330 yards distance. Connections will be made to the various wells. The high-tension lines, also the power lines between the wells, will be strung on steel poles mounted on concrete piles, driven in sets of two, each set being 220 yards apart.

Electricity will be generated at 2,300 volts, a main substation stepping it up to 35,000 volts, others substations (of which there will be seven) will step down the current to 440 volts, 3-phase, 60-cycles. The initial power will be sufficient for drilling and pumping operations for about 500 wells, so the additional 5,000 kw. unit will not be installed until power demands warrant it.

For the time being the present steam equipment will be used where the pumps and boilers have been operating for but a short time; but as they become worn out they will be discarded. Electrical equipment will be used on all new wells. The work of electrification is being carried out under the direction of C. Elder, Chief-Engineer of the Venezuelan Gulf Oil Corporation, and all materials are being purchased by the oil company.

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Oil Field Exports

EXPORTS from the U. S. A. of oil well and refinery machinery still continue to advance, and equipment shipped to other countries during the first seven months of 1930 are nearly 15 per cent above those of last year. Oil and gas well drilling apparatus amounted to $6,271,000, and oil refinery machinery $10,442,000.

Petroleum Imports and Conservation

Refinery Construction Abroad Would Be Stimulated by Any Attempt of America to Rely Solely Upon Its Own Oil. Diversion of Present Imports Would Crowd Out Export Business . . .

THE time was when the amount of crude produced in Sumatra no more concerned the American oil man than a stray silk-worm in the United States bothered the silk industry of Japan. Today the picture is entirely different. The same factors of scientific research, new sources of supply, expanding markets and better understanding between nations which combined over a period of years to break down old policies of exclusion and broaden the field of international trade have worked a corresponding change in the oil business.

Nationalities have been forgotten, in the great undertaking of stalking the black genii of power through his haunts all over the globe, to an extent unknown in practically any other human enterprise. American and British oil engineers have worked side by side in Iraq. The geologist from the United States is likely to meet a party from Holland in his rovings through Venezuela. International in its benefits, petroleum in its production, transportation, refining and marketing has likewise become an international problem.

Every new field, regardless of the boundary lines which man and Nature have drawn across the lake of world crude supply, is a pebble tossed into the water, the effect of which is felt on the farthest shore. Every drop in crude output, like a pail of water taken from the lake, creates a backwash, be it ever so slight.

The same basic economic laws that apply in the production and distribution of every other commodity with a world market govern the ebb and flow of crude petroleum and finished products back and forth over the face of the globe. The consumer invariably seeks the lowest price consistent with the quality of and demand for the product he buys, and the working out of this elementary law extends all the way back to the source. All other things being equal, the refiner looks for the best crude that will answer his requirements at the lowest price. If it costs less to transport by tanker than by pipeline, it comes by tanker. Or vice-versa. If gasoline is wanted and straight-run appears more economical and advantageous in our hypothetical case than cracking, then straight-run is used. And so on down the line.

That is one side of the picture. Now see what happens to the numerous rivulets that flow from hundreds of different fields all over the globe into the vast lake that is our world crude supply

Petroleum, like any other raw material, seeks its most favorable market, no matter in what corner of the world it may have been discovered. Foreign oil finds its way into the United States in addition to domestic production in exactly the same way that American gasoline and other finished products travel across the seas to nations which already produce their own oil. One country may have flush production near the seaboard which makes it possible for it to send out tank steamer loads of crude to find a market. And the nation right next to it may have to obtain its supplies from abroad because the oil in its hills is too inacessible and expensive to produce to compete with imported products.

Thus it happens that Nature and the ordinary workings of economic laws have given the American oil man two sources of supply — domestic and foreign. Today he finds himself with too much oil on his hands. Let's see where the trouble lies.

Taking the last ten years, which covers the approximate period of oversupply in the United States, we find in the accompanying table that imports of crude and products have remained practically constant, while domestic production has more than doubled. Imports in 1929 were practically the same as they were in 1920, with the increase in 1921 and 1922 more than offset by reductions in later years. Moreover, for the past seven years, more oil has been going out than coming in, exports over-balancing imports by nearly 300,000,000 barrels, or 47% during that period. During the first six months of 1930 the industry's curtailment program has extended to imports and domestic production alike, the former having dropped off 4% from the same period last year, and crude output of American fields showing a reduction of 2.95%.

While imports for the last ten years have averaged a constant figure, exports have followed the trend of domestic production and have shown an increase

PETROLEUM, like any other raw material, seeks its most favorable market, no matter in what corner of the world it may have been discovered. Foreign oil, says THE LAMP in its latest issue, finds its way into the United States in exactly the same manner that American petroleum products travel across the seas to nations which already produce their own oil. For America to shut off the spigot of foreign supply and rely solely upon its own oil would back-up present imports on the rest of the world, tend to force down the price, crowd out present export trade, and take away just that much business from the industry in the U. S. A. Exports are mostly refined oils and imports crudes. WORLD PETROLEUM publishes this Standard Oil article as it forms an endorsement of opinions repeatedly outlined.

American Production, Imports and Exports.

Year	U. S. Crude Production (Barrels)	U. S. Imports (Crude and Products) (Barrels)	U. S. Exports (Crude and Products) (Barrels)
1920	449,151,000	108,794,000	77,993,000
1921	472,897,000	128,783,000	70,723,000
1922	556,512,000	135,947,000	72,873,000
1923	746,516,000	99,657,000	100,436,000
1924	719,346,000	95,325,000	115,869,000
1925	760,059,000	78,851,000	113,400,000
1926	766,668,000	81,293,000	131,826,000
1927	906,416,000	71,852,000	141,276,000
1928	888,676,000	91,556,000	154,647,000
1929	1,001,702,000	108,698,000	162,434,000
Total	7,267,943,000	1,000,756,000	1,141,477,000

In ten years production in the United States has more than doubled, imports have remained stationary, while exports also have doubled.

of over 100%. But consumption at home has not kept pace with the tremendous growth of the supply and the exports have not been enough to carry off the overflow. The result has been a ten-year increase in stocks of 486,000,000 barrels.

Even though he has only himself to blame for it, the fact remains that the oil man has too much supply on his hands. What is he going to do about it? He can do one of three things. He can shut off the spigot of foreign supply. He can turn down the flow from his own wells enough to balance supply and demand. Or he can reduce both in proportion.

Let's see how the thing would work out.

For the United States to attempt to rely solely upon its own oil could only result in diverting present imports of crude and products into foreign channels. This backing up of material on the rest of the world would, by the simple law of supply and demand, tend to force down the price. The net result would be the stimulation of foreign refinery construction, the output of which would crowd out present American exports and take away from the industry in the United States just that much business. In the end the oil level in this country would remain practically unchanged.

To go to the opposite extreme and unload the entire job of regaining balanced operations upon the industry in the United States—even though the blame for the present oversupply is on its own shoulders — would undeniably work a hardship on some producers. The only common sense program would seem to include a proportionate reduction of both imports and domestic production.

In view of the whole situation, although its own operations were then in balance, the Standard Oil Company (N. J.) announced last March that it would follow the suggestion of the Federal Oil Conservation Board in undertaking a curtailment all along the line. This, of course, involved a reduction in its receipts of crude.

Believing it manifestly unfair to discriminate between domestic and foreign producers, the company extended this reduction to cover domestic crude and imports of crude and products alike. Figures for the first six months of the current year show the effect of this action.

In that period domestic subsidiaries of the Standard Oil Company (N. J.) received 10,235,277 barrels in imports of crude and products, as compared with 12,371,902 barrels for the first half of 1929—a reduction of 2,136,625 barrels, or 17.27%.

Imports and Exports, First Seven Months of 1930 Compared with Same Period of 1929. (U. S. Bureau of Mines)

IMPORTS

Year	Crude Oil Bbl.	Refined Oil Bbl.
1930	37,007,000	25,627,000
1929	49,974,000	14,249,000

EXPORTS

Year	Crude Oil Bbl.	Refined Oil Bbl.
1930	14,067,000	81,593,000
1929	14,612,000	78,047,000

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Petroleum Progress in Mexico

WORK has been started upon the pipe line which the Mexican Eagle Oil Company, subsidiary of Royal Dutch-Shell, is building into Mexico City from Palma Sola in the Furbero petroleum zone in the state of Vera Cruz. The line will be of standard 10 inch pipe, welded solidly all the way through to the national capital and will be about 240 kilometers long, with a daily capacity of 7,800 bbl. It will feed a large refinery which the company has been granted a concession to build in the Municipality of Atzcapotzalco, Federal District, just outside the limits of Mexico City. The refinery will have a capacity of about 7,500 bbl. per day. Line and refinery will represent an investment of upward of 7,000,000 pesos (approximately $3,500,000). Both the line and refinery are expected to be completed in about 12 months.

While the pipe line will not be of great length, comparatively, its building will be something of an engineering feat, for it will traverse mountainous regions which will make it necessary to run the line up 8,200 ft. in the first 100 miles from the starting point. Six powerful electric pumping stations will be necessary to force the oil up this tremendous grade. From the peak, however, all the way into the refinery there will be no pumping stations, as the oil will flow by gravity.

The route of the line will be: Palma Sola, Necaxi, Catalin, Beristain, Asseradero, La Cima, Ventaquipo, San Isidro, Xola, Otumba, Teotihuacan, Grand Canal, Santa Clara, La Villa and Mexico City. The job is being handled by the Martin Construction Company, and L. Scily is the engineer in charge for the Mexican Eagle Oil Company. Twenty kilometers of pipe have already been delivered to concentration points at La Villa, Santa Clara and Grand Canal, and from 300 to 400 joints are being shipped daily to those places. More material is going to Beristain, whence construction is being carried out in both directions. Two welding gangs, three road gangs and two transportation gangs, a total of some 2,000 men are working on the job.

The Company believes that the pipe line and refinery will bring about a reduction in prices of petroleum and its products in the Federal District area. The new line, however, will cause a great loss to the National Railways of Mexico in freight revenues. At present all oil and its products are shipped by these railroads from the petroleum fields to Mexico City.

Mexican Eagle Oil Company officials emphatically denied reports published by the local press to the effect that the Huasteca Petroleum Company is joining hands with the Eagle in the construction and use of this pipe line. The officials declare that the line will be constructed and operated solely by their company.

Revenues from taxes on gasoline production and importation yielded the Mexican government 7,021,798.08 pesos (approximately $3,510,399) during the first seven months of the present year, announces the special taxations bureau

(Continued on page 439)

Story of Petroleum Hydrogenation

Facts Concerning What Constitutes the Greatest Step Yet Made in the Oil Refining Industry. Standard Oil Releases Full Information on Process

By R. T. Haslam and R. P. Russell

Vice-President and General Manager, Standard Oil Development Co. — *General Manager, Hydro Engineering & Chemical Co.*

FED for many months with more or less vague reports of what hydrogenation actually means to petroleum refining, the entire oil world has been awaiting with great interest the real facts. Up to the publication of this issue of WORLD PETROLEUM no complete description of hydrogenation and exactly what it will do has been released to the press. It will be apparent upon reading this article that the recent development to a commercial stage is of the greatest importance to the petroleum industry, especially as the process can be adapted to producing motor fuel, etc., from coal.

CONDITIONS under which commercial hydrogenation has been practiced since the time of Sabatier have been restricted until the last few years to the use of (1) hydrogen at substantially normal pressure or two or three atmospheres above normal, (2) hydrogen of a high degree of purity particularly with respect to such catalyst poisons as sulfur,* arsenic and the like, (3) powerful but sensitive catalysts of the type of reduced nickel and (4) temperatures safely below those at which thermal decomposition of the stock to be hydrogenated takes place. Coal and oil, both always containing sulfur, were not amenable to this type of hydrogenation, and it was therefore restricted to animal and vegetable fats and oils. By eliminating the catalyst and substituting hydrogen pressures one hundred fold greater than had previously been used, a high degree of liquefaction was obtained, but the oils thus produced contained relatively large percentages of oxygenated bodies of the cresolic type making the oils hard to crack or refine. The able and resourceful research organization of the I. G. Farbenindustrie, through their experimentation, recognized the need of greater hydrogenation intensity than obtainable with hydrogen pressures then commercially permissible and developed a line of sulfur-resistant catalysts which materially speeded up hydrogenation and caused the elimination of all the oxygen from the hydrogenated product. In addition, their long experience in the field of synthetic ammonia enabled them to devise apparatus and methods for better carrying out this type of hydrogenation in a continuous manner.

* Official spelling of the American Chemical Society.

Preliminary Tests

Some three years ago the Standard Oil Co. (New Jersey) through its Development Company, joined with the I. G. in the further development and commercialization of this method of treatment, and erected special laboratories for high-pressure experimentation at the refinery of Jersey's subsidiary, the Standard Oil Company of Louisiana at Baton Rouge, La. Previous efforts had been largely directed towards the conversion of coal to gasoline or the conversion of asphaltic crudes and residual fuel oils to distillate naphthas and gas oils. Although work along these lines was continued with particular emphasis on the simplification of the process, much of the effort of the Baton Rouge staff, in cooperation with the I. G., was to broaden the use of the process. It is now felt that something more than a process of adding hydrogen to coal and oil has been developed, namely, a flexible method of treating and refining by the use of hydrogen of wide application in the oil industry.

The work herein presented was carried out by the research staff of the Baton Rouge laboratory, and while some of the data are from half-barrel per day experimental units, practically all of the results given also have been demonstrated commercially in the one-hundred barrel per day pilot or demonstration plant erected about two years ago at Baton Rouge along the general lines of the larger plants of the I. G. Farbenindustrie in Germany.

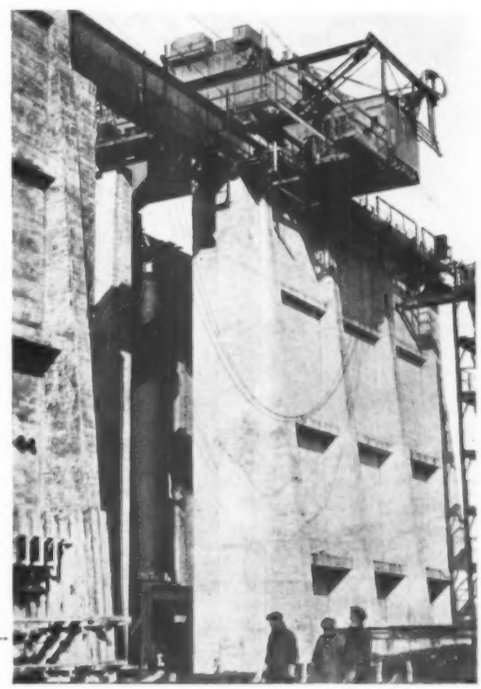
It will be understood that disclosures to be made in this treatise, and the process and its applications as described are fully covered either by patents issued, or by applications for patents.

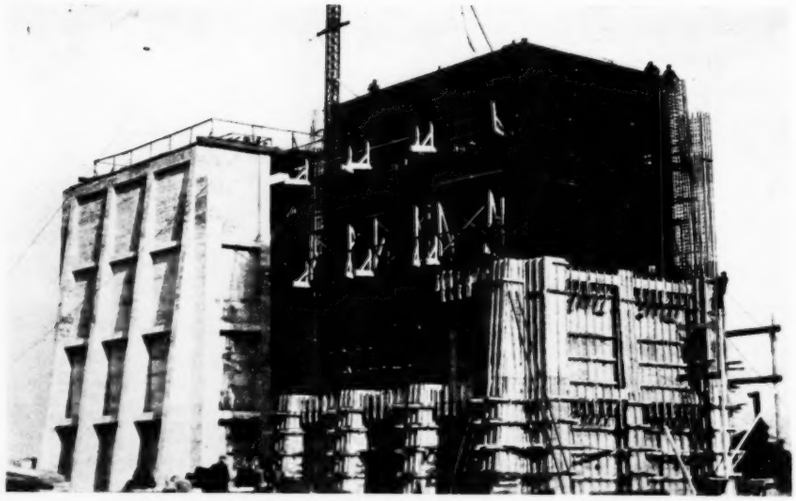
Description of the Process

In each of the major applications of hydrogenation discussed in this paper the equipment and even the arrangement of this equipment is essentially the same, the results obtained being controlled by suitable alteration of operating conditions. The charging stock together with sufficient hydrogen is pumped into a reaction vessel containing catalyst where at the desired temperature, and at about 3,000 lb. per sq. in. pressure, the reaction is allowed to take place. A panoramic view of the first large-scale plant in the United States, at the Bayway (N. J.) Refinery of the Standard Oil Co. of New Jersey is reproduced.

Hydrogen may be produced by any of the usual processes. Since the hydrogen does not need to be sulfur-free, its production from coal or coke by the water-gas process is somewhat simpler

Hydrogenation retorts are surrounded by massive reinforced concrete walls.





The great strength of the protecting concrete walls is apparent

than when the hydrogen is to be used for the production of ammonia. Hydrogen may also be produced by liquefaction and distillation of the easily condensable gases from by-product coke ovens, or electrolytically when the economies permit. For the oil industry, with its generous supply of refinery and natural gas, hydrogen may be made by the treatment of hydrocarbons with steam in accordance with the following reactions:

(1) $CH_4 + H_2O = CO + 3H_2$.

(2) $CO + H_2O = CO_2 + H_2$.

After scrubbing out the carbon dioxide the hydrogen is of sufficient purity. Catalysts are helpful and are usually used in carrying out each of the above reactions.

The oil and previously compressed hydrogen are mixed together and delivered through heat exchangers to a coil furnace and thence to a catalyst-containing reaction vessel. The degree of hydrogenation is carefully controlled depending on the results desired, control in general being maintained either by alteration of catalyst or of operating conditions.

From the reaction chamber the combined final products and gases pass through heat exchangers and coolers to a high-pressure separator, where the liquid product is separated from the unconsumed hydrogen and other gases. The liquid product is finally reduced to atmospheric pressure and sent to rundown pans.

Much of the sulfur in the feed stock appears as hydrogen sulfide in the unconsumed hydrogen leaving the high-pressure separator. This combined gas may then be scrubbed with oil under pressure to remove the hydrogen sulfide and "boosted" back to full operating pressure in a booster compressor, which operates through a pressure interval equal to the pressure drop across the system. This unconsumed gas mixes with the feed oil and fresh hydrogen just before the exchanger inlet.

Since no coke is formed in the process, and since the catalysts employed are extremely rugged, the process is virtually continuous. Runs of as long as eight months' duration have been made in Germany on full scale units, and in the United States laboratory-scale and small commercial units have operated continuously for three months and more, the units being shut down only because the equipment was needed for other purposes.

Major Adaptations of Hydrogenation

There are five adaptations of hydrogenation which appear to be of most immediate importance in oil refining. These are:

(1) The conversion of heavy, high-sulfur, asphaltic crude oils and refinery residues into gasoline and distillates low in sulfur and free from asphalt, without concurrent formation of coke.

(2) The alteration of low-grade lubricating distillates, to obtain high yields of lubricating oils of premium quality as to temperature-viscosity relationship, Conradson carbon, flash and gravity.

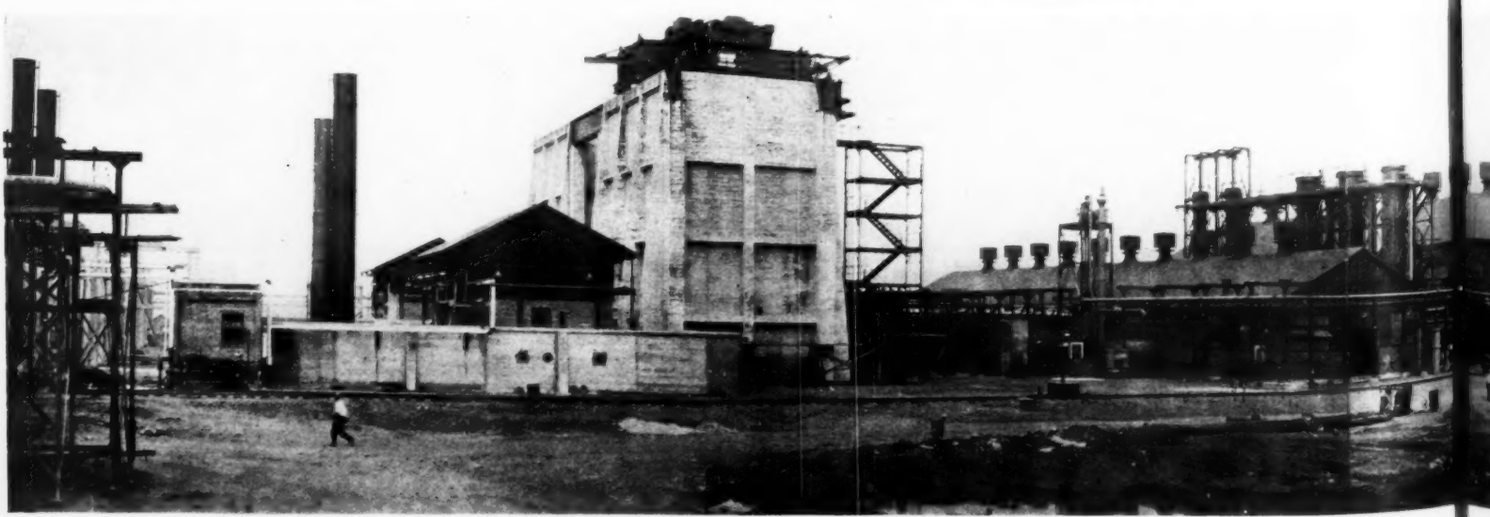
(3) The conversion of off-color, inferior burning oil distillates or light gas-oils into high-gravity, low-sulfur, water-white, oils of excellent burning characteristics, with gasoline being the only other product except for a slight gas formation.

(4) The de-sulfurization, color and gum-stabilization of high-sulfur, badly gumming cracked naphthas without marked alteration in distillation range and without major loss in anti-knock value. (It is possible to so operate as to actually better the anti-knock quality).

(5) The conversion of parafinic type gas-oils into low-sulfur, gum and color stable, good anti-knock gasolines without the production of coke or heavy product.

The processes described under (1), (2) and (3) above may all give more than 100 per cent volumetric yield; i.e., from 100 bbls. of a residual charging stock the process will give 101 or more barrels of gasoline and gas-oil. Similarly, in treating 100 bbls. of a low-grade lubricating distillate, 103 or more barrels of a mixture of gasoline and gas-oil

Panoramic view of the first commercial hydrogenation plant, Bayway, N. J.

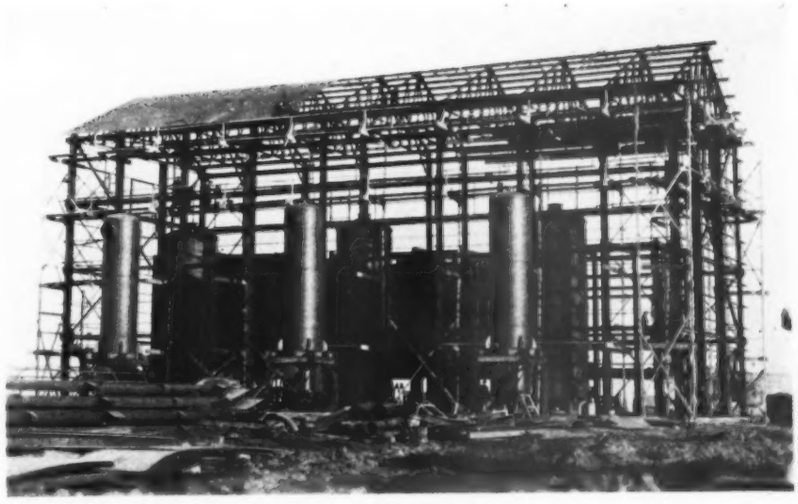


together with the improved lube-oil will be obtained. In up-grading 100 barrels of a burning-oil distillate, 102 or more barrels of product (approximately 70 per cent burning oil and 30 per cent gasoline) will be obtained. The various processes just mentioned are further summarized in Table I.

The salient features of these adaptations of hydrogenation are discussed in the following sections:

I. Converting Refinery Residues Into Gasoline and Gas-Oil.

The conversion of coal or heavy, asphaltic, high sulfur products into high yields of gasoline is probably the most widely discussed adaptation of hydrogenation. By the present methods of cracking, part of the charge stock is upgraded into light, valuable product in the form of gasoline, while the remainder is degraded into gas, coke, and heavy fuel oil, all of lesser value than the feed stock. In contradistinction to the present processes for cracking, hydrogenation may up-grade even up to 100 per cent of the charging stock, into lighter and power boiling point products. This major difference from the other forms of increasing gasoline yield, and the ability to utilize materials practically impossible to handle by other existing methods, tended to make this application of hydrogenation appear spectacular.



The gas-plant, where hydrogen will be manufactured, under construction

Table I—Summary of Applications of Hydrogenation in Oil Refining

Process	Charging Stock High Sulfur,	Primary Result	Approx. Volumetric Yield of Gasoline	Burning Oil	Gas Oil	Lube Oil	Total Volumetric Yield	% of Sulphur in charge removed in process	Gas formation % by wt.
1	Asphaltic Heavy Residue Low Grade	Asphalt and sulfur elimination with simultaneous conversion entire charge into distillate oils.	30%	....	71%	....	101%	65-85	2- 3%
2	Lube Distillate	Production premium lube, particularly as regards temp.-visc. relationship, flash, carbon and gravity.	10%	....	29%	65%	104%	80-95	0.5-1.5%
3	Low Grade Burning Oil Distillate	Production of low sulfur premium grade burning oil.	30%	73%	....	....	103%	80-95	0.5- 2%
4	Cracked Naphtha	De-sulfurization and gum stabilization without the deterioration in yield and knock rating characteristic of acid treating.	100%	....	....	....	100%	50-95	0.5%
5	Paraffinic Gas Oil	Production of low sulfur, low gum, good anti-knock gasoline.	65-100%	....	....	....	70-100%	80-95	5-35%

For the hydrogenation of heavy asphaltic crudes or residues from these crude oils or from cracking processes, two types of operation may be used. The first of these takes place mainly in the liquid phase and serves to convert the heavy charging stock into 100 per cent or more by volume of product of a more highly paraffinic nature than the charge stock. The gasoline content may represent from 5 per cent to upwards of 35 per cent of the liquid product from this first stage in the operation and the balance is a distillate oil. If a higher yield of gasoline is desired, the heavier part of the product may be recycled in the same unit or the total product may be hydrogenated in the vapor phase in a separate unit and converted completely to gasoline.

During liquid phase hydrogenation, the asphalt content may be completely converted and two-thirds to three-fourths of all the sulfur in the charging stock eliminated. This sulfur comes out as hydrogen sulfide and is scrubbed out of the recycle gases as mentioned earlier. Even if the product charged is highly asphaltic and of high sulfur content, the gasoline produced is easily finished to give a low-sulfur, gum-stable product. The anti-knock value of the gasoline is dependent somewhat on conditions, particularly the type of charging stock.

(To be continued in the November issue of WORLD PETROLEUM.)

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International Petroleum Exposition

Executives and Technical Experts From the Oil Fields of the World Visit Tulsa Each Year To Examine the Latest Petroleum Equipment.

. . .

By W. G. Skelly
President, International Petroleum Exposition.

INCREASING each year its hold upon the interest of the men engaged in the various branches of the oil and gas business, the Seventh International Petroleum Exposition & Congress, scheduled for October 4-11, in Tulsa, Okla., is setting the stage for the largest and most instructive industrial show in the world.

No efforts have been spared in repaying the confidence of the hundreds of executives who are sending their key men to the oil show. No slightest phase of the industry, scientific, routine field and plant work, commercial, administrative or relating to local and international policy, has been overlooked. No restrictive policies limit the range of this impartial university, and oil and gas employes, high or in modest position, may confidently look forward to filling in the gaps in their experience with the most up-to-date facts available.

Significant of the important place the "World's Fair of the Oil Industry" holds is its power to draw the most influential organizations of the business. Holding their annual meetings in Tulsa during the Exposition season are the directors of the American Petroleum Institute, presided over by President E. B. Reeser; the general committees, A. P. I., divisions of production and marketing; the general committees, A. P. I., division of refining; National petroleum meeting, American Society of Mechanical Engineers, with President Charles Piez presiding.

The Society of Mechanical Engineers has followed its construction of an $85,000 automatic pipe-line pumping station (a research project), at the Oil Show grounds with a very interesting and valuable program of papers, to be presented in the auditorium, October 6, 7 and 8.

The general committee on scientific and technical displays has announced that the department of the Exposition covering this phase of the industry will be the most complete ever presented. The activity which has marked the laboratories and workshops of the industry during the past year have made it necessary to change the organization of this committee so that each branch of the business will receive the attention of a sub-committee of specialists.

The continuous program of demonstrations ranging from the most acceptable field and plant practices to safety first and first aid work, is not the least factor in making the Oil Show really worthwhile.

Actively co-operating with the officers and directors of the Oil Show are the following societies and associations devoted to furthering the interest of those engaged in the oil and gas industry and the understanding which must characterize the relationship between the industry and the public:

Oil men of the world gather at Tulsa

The American Petroleum Institute, especially the board of directors, the division of standardization and the division of production and development engineering; the American Institute of Mining and Metallurgical Engineering, petroleum division; the American Society of Mechanical Engineers, petroleum division; the American Chemical Society; the American Welding Society; American Association of Petroleum Geologists; the American Association of State Geologists; the National Safety Council, petroleum division.

The United States Bureau of Mines, petroleum division; the Mid-Continent Oil and Gas Association, of which the safety division takes an important part in the Exposition program in the lines of first aid and safety first demonstration; the National Petroleum Conservation Service; the Natural Gas Association; the Natural Gasoline Manufacturers Association of America; the Natural Gasoline Supplymen's Association; the Purchasing Agents Association, oil and gas division, the Scouts and Land Men Association; the Mid-Continent Royalty Owners Association; the Independent Petroleum Association of America.

The men who wish to make the 1930 "World's Fair of the Oil Industry" the greatest educational factor in the business are grateful also to the following ardent supporters for their services.

The United States Department of Commerce; the U. S. Bureau of Standards; the geological surveys of Oklahoma, Louisiana, Colorado, Kentucky, Texas, Arkansas, New Mexico and Kansas; the governments of Venezuela, Canada, Mexico, Germany, France and Roumania, which have already stated that they will participate actively; the American Express, which has published much information about the Oil Show abroad and has arranged itinerary which begins at Southampton, England, Sept. 24, and includes an eight-day visit at the Exposition; the White Star Line and the United States line steamship companies are especially active.

The railway systems of the United States, Canada and Mexico are directly responsible for the large attendances which have marked every Exposition and Congress, in that their associations have offered the advantage of reduced rates to Congress visitors and have done much to publicize the event.

It may be pointed out that in 1928 the passenger traffic increase for the oil event called for 99 extra Pullmans; in 1929 the number of extra Pullman cars rose to 125, and for 1930 this number will go to 175.

Venezuelan Viewpoint of the Reglamento

Interesting Discussion of the New Petroleum Regulations as Seen by the Venezuelan Eye, Specially Prepared in Caracas for World Petroleum . . . . (Translated From the Spanish)

EXPLOITATION of petroleum in our country of Venezuela began under rather exceptional circumstances, the country at that time being without the technical and practical knowledge required for legislation on a matter which like petroleum is subjected to so many intricate, scientific and industrial processes. Therefore, it is not surprising that our petroleum legislation has developed very slowly from 1918 when the first laws on the subject were written, until the current year when there was promulgated on August 7, the Regulations under the Law Regarding Hydrocarbons and other Mineral Fuels.

Up to this time the Hydrocarbon Law was operated by its "dead lift"; that is to say, the authorities who have such matters in charge lacked the means of interpreting and enforcing the law, other than the one-sided information presented by interested parties. There existed no useful means whereby government officials could take accurate records of certain work; for example, the drilling of wells, information concerning which was necessary for preparing and recording statistics of the industry.

Although an inspection service had existed in principle, it was not put into practice as has now been done by the creation of three Technical Inspectors of Hydrocarbons and other Mineral Fuels. The Minister of Fomento (Minister of Industry), under whose jurisdiction the oil industry actually belongs, in making his report to the last session of the National Congress, announced that his Department was actively occupied with the organization of a rational and efficient service of inspection and fiscalization of petroleum production, and which has since begun to function through the above mentioned Technical Inspectors. It may be mentioned that one of these inspectorships, namely that for the District of Maracaibo, is occupied by a young Venezuelan geologist who has taken his diploma at one of the universities of the United States of America.

JEFE JUAN VINCENTE GOMEZ

Reproduction of autographed portrait recently sent to World Petroleum by General Gomez.

The new regulations embrace various points, among which we will mention the most characteristic as best complying with the spirit and purpose of the law.

Chapter II of the Regulations, treats with the surveys of concessions, which every concessionaire is required to present to the Minister of Industry in accordance with Article 14 of the Law. These surveys must be drawn on white drawing paper of good quality. Surveys of this class cannot be drawn on tracing paper (See Article 18).

Aside from this requirement the drawing must be accurate. The use of tracing paper facilitates drawing the surveys, but is considered prejudicial to accuracy. The oil companies use drawing paper in plotting the results of topographical surveys, obtaining thereby what is called a "hard copy" for study and reference and which they keep as a definitive or master survey of the concession for referring to in all questions that come up with respect to the limits of the concession. On the other hand, the Minister of Industry also has to study the survey presented to him, an operation which is difficult when the survey is drawn on tracing paper. The prevailing opinion among the technical men is that a drawing on tracing cloth is regarded only as an approximate representation of what it is desired to show, and never as an exact drawing.

Article 23 requires that those portions of rivers situated within the perimeter of the concession must be accurately shown on the survey throughout its entire extent.

When the concession represented by the survey is traversed by roads, passable for automotive vehicles (Article 24), these are to be shown on the drawing under the same requirements as above indicated for showing the rivers.

In the same manner and according to the same regulations there should be shown on the survey all railroads, national or individual, also the pipe lines which pass through the concessions. In addition, there are to be shown other features such as neighboring farms, villages, railroad stations, and in general, all topographic details which are necessary for the correct delimitation of the concession.

None of the above requisites are foreign to or unusual in a general topographic plan and their location may be considered as an advantage to the interested parties because of the factors of accuracy which they introduce into the map.

We have mentioned the above details contained in this Chapter for the benefit

of the reader who is not familiar with topographic details, because all of them bear on the question of accuracy and are a means of preventing any possible frauds which may arise to the prejudice of legitimate interests.

Articles 47 and 51 describe the manner of liquidating and paying the imposts or levies which are to be liquidated in the capital of the Republic, and are payable to the Administrative Bureau of the Ministry of Industry; but the latter in special cases where it is justified by the convenience of the service may allow the liquidation to be made at any of the liquidation offices functioning in the capitals of the different States or in other places.

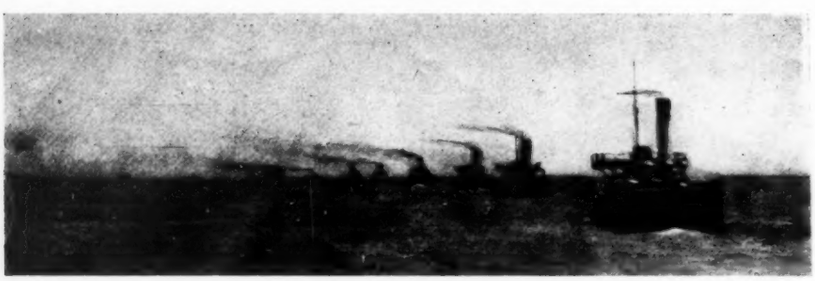
Article 49 of the Hydrocarbon Law prescribes that the concessionaires shall enjoy exemption from import duties (when they have complied with all the legal requirements of the country) on all the instruments, apparatus, machinery and accessories, boats, chattels, manufactured iron, bags, vehicles, sanitary goods, hospital supplies and portable buildings used in the work of exploration, exploitation, refining, transport, etc. The regulations prescribe the formalities to be followed in making this class of imports, in terms which appear to make it quite easy for oil companies. On the other hand Article 73 requires the use of revenue stamps, which according to Par. R of No. 43 of Article 19 of the National Stamp Law are not to be required on the invoice of goods exempt from tariff duties provided that the Minister of Industry shall have expressly announced that they may be dispensed with. The applicant will thereby be subject to a certain loss if he omits to use these stamps prior to having received notice of exemption.

The Gulf and Creole fleets ply between Maracaibo and Paraguana.

The exemptions of tariff duties in 1929 amounted to Bs 62,787,357.74. (Approximately $12,557,451). This amount exceeded by Bs 15,807,270.92 the total income of the Ramo de Minas (Department of Mines), which last year amounted to Bs 46,980,270.82.

Of course the Venezuelan Government has the imminent right of inspection and fiscalization over any industry of public interest, particularly with regard to petroleum. The Law bestows upon the Government this right over the concessionaires' work of exploration, exploitation, manufacture or refining, and transportation, of hydrocarbons and other mineral fuels, as well as over the operations of concessionaires subjected to imposts, and to collect all the data relative to the development of the industry. More than a right, that is as mere authority, inspection and fiscalization, becomes the duty of the Public Administration because from the exercise of this duty depends the preservation of Hydrocarbons, the efficient exploitation of the industry, and the collecting of numerous data that may serve as a basis for making up Statistics of the business of petroleums and other mineral fuels.

Royal Dutch-Shell and Aguila tanker fleets en route from Lake Maracaibo to Curacao and Aruba.



Lago tankship fleet proceeding from Lake Maracaibo to Aruba.

On this order of ideas is founded that part of the Regulations relating to the three Technical Inspectors of Hydrocarbons who function in the city of Maracaibo, capital of the State of Zulia, in the city of Maturín, capital of the State of Monagas, and in the city of Coro, capital of the State of Falcón.

Each of these Inspectorships is under the supervision of a Technical Inspector who has under his charge a certain number of field inspectors, assistants, and such other employees as the Minister of Industry may deem necessary. Besides, they are to be provided with a chemical laboratory furnished with all equipment necessary for the analyses of petroleum, gas and their derivatives, in order to estimate their weight, grade of humidity and other conditions, and for carrying out proper inspection.

To fill the position of Technical Inspector it is stipulated that, among other conditions, the official must be an engineer or a geologist; and know the legislation on hydrocarbons and other mineral fuels as well as Custom House legislation.

The establishment of these Inspectors in the petroleum industry's movement will be very useful for the realization of the mineralogical and industrial studies that concern the Ministry of Industry, particularly hydrocarbons which now form such a preponderant place in the national economy of Venezuela.

Among the duties of the Technical Inspectors (Article 86, 3° of the Regulations) they are required to carry three Record Books to wit: one to record applications relating to perforation, torpedoing and capping of wells, and permits granted or refused regarding the same; another to record the daily gas and crude petroleum production; the quantities consumed daily on the exploitation fields and in the refineries; quantities exported, and those transported to other parts in the Republic; and the third to record the daily production of gasoline, kerosene and other products derived therefrom, the quantities exported, and also the sales for domestic consumption.

Inspectors are also required to form and keep a small museum, or specimen

record, of the principal crude petroleums and their derivatives, of rocks and fossils, and of geological well cores. The concessionaires are obliged to supply the Technical Inspectors with such samples when requested.

Without this organization the Government of the Republic would not be in a position to know the extent and the details of the petroleum industry, so strongly related in various respects to the activities of the administration. Today our country is preparing to have an official exhibit at the Seventh International Petroleum Exposition shortly to be held in Tulsa, Oklahoma. A delegate is being sent, and comprehensive samples for the exhibit are being prepared in Maracaibo by C. C. McDermond.

Section Fourth of the Regulations refers to wells, and prescribes the distance at which these should be located in relation to the boundaries of the respective concession; the distance from well to well, and the distance in relation to other features in the field.

their district, the petition being accompanied by the original agreement duly authenticated or by a certified copy thereof. The permit may be granted whenever there appear to be no technical reasons, or reasons of public interest, against the exploitation of the referred strip."

Likewise it is established by Article 91: "The concessionaire who intends to bore a well, must, before beginning the work, ask for the necessary permit by applying to the Technical Inspector of his district. He must send two copies."

This, as are the other requisites mentioned before, is necessary for statistical purposes, otherwise the Administración de Minas would not be in a position to know, at any given moment, the number of wells opened, unless he takes pains to refer in every concrete case to the private report furnished him by the companies themselves.

Article 92 makes it obligatory in certain cases to ask a permit from the Technical Inspector or the Field In-

laws of other countries on the matter.

In short, the Regulations do not alter in any way the fundamental character of the law on Hydrocarbons and other Mineral fuels. The application is limited to making it effective, at the same time that it fully guarantees the interests of the exploration or exploitation petroleum companies to whom the country has given and gives every facility tending to stimulate the investment of capital in our territory, where, according to recent computation, amounts ranging from $3,000,000 in 1914 to $200,000,000 for 1930 have been invested in the petroleum industry.

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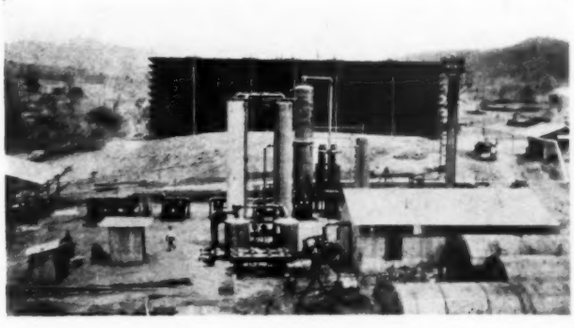
Petroleum Progress in Mexico

(Continued from page 432)

of the Treasury Department. According to the bureau, the revenue by months was, as follows:

January, 847,152.88 pesos; February, 942,794.19; March, 983,682.06; April, 904,133.75; May, 1,170,194; June 1,154,-



For a year this Braun absorption plant of the British Controlled Oilfields Ltd., at El Mene, Venezuela, has been making 15,000 gal. gasoline per day from natural gas. Gas content is about 0.5 gal. per 1000 ft.

This Braun absorption plant is one of three just built for the Lago Petroleum Corp'n, and is located on the Lake of Maracaibo on concrete piling, including boilers, tanks, towers, distillation and absorption units.

In the first case it is ordered that they must be at a distance of at least thirty meters from the boundaries of the concession as a measure of protection against damages to the neighboring concessions; but as it is not in any manner intended to hinder the free exploitation of the fields. The same Regulation establishes under Article 90 the following: "Petroleum wells can also be perforated at less than thirty meters from the boundaries of the concession, as long as the neighboring concession belongs to a different owner and both concessionaires agree between themselves to exploit the sixty-meter strip of land composed by the two thirty-meter strips of the two neighbors. To this end they shall make an application to the Ministry of Industry through the Technical Inspector of

spector to torpedo a well; this permit will be granted (Article 94) whenever it is proven that the quantity of explosive to be used does not exceed the quantity necessary to obtain the desired effect, and that its destructive power will not reach the lower part of the casing, nor cause damage to neighboring wells.

The Regulations contain other dispositions such as those relating to the duty of the concessionaires to carry an exact account of the works of perforation, cementation of wells, economy of natural gas, vigilance over the production of gas and petroleum of each well in order to avoid it from becoming excessive, capping of wells, all of which is justified by the practical needs of the industry and is in harmony with the most advanced

395.36 and July, 1,019,445.84 pesos.

The Supreme Court of the Nation has upheld an injunction obtained by the Huastecas Oil Fields Corporation (Standard Oil Co. of Indiana), against the action of the Ministry of Industry, Commerce and Labor in granting petroleum concessions to the Gulf Coast Corporation and the Southern Fuel and Refining Company in the Cacalilao District, state of Vera Cruz, despite the fact that the plaintiff company had filed a prior application for a concession to these lands. Lawyers for the Huastecas Oil Fields Corporation contended that the Ministry by this action had violated regulations of the Petroleum Law. The ruling nullifies the concessions held by Gulf Coast and Southern Fuel.

DOUGLAS GRAHAME.

Colombia—Today's Oil Situation Reviewed

New and More Favorable Legislation May be Anticipated From the New Government. Past and Future Situation Discussed From Various Angles.

. . By J. Pointer

IN NO country has oil legislation been debated more extensively or caused more needless misunderstanding than in Colombia. These difficulties, however, promise to be happily settled through the far-sighted and wise statesmanship of the new President of Colombia, Dr. E. Olaya Herrera.

There are in Colombia 34,000 square miles of probable oil lands of which hardly three miles have been drilled, the drilling being done by the Tropical Oil Company in the de Mares concession on the Magdalena at Las Infantas field. The 311 or more wells of this concession have produced from six to eight thousand barrels a day each at a depth of about 2,000 feet. At the famous Barco concession at Santander del Norte oil was struck in 1919 at a depth of only 840 feet, and this concession is one of the rich prizes of the Colombian venture. It is indisputable, that the petroleum resources of this great country are large, a condition of which the Colombians as well as the major international oil companies are fully informed.

As soon as it became evident that there was such a wealth in the subsoil of Colombia difficulties were met in enacting legislation fair to both Colombia and the foreign companies. Most of them can be traced to what has been captiously characterized by foreigners as a Colombian "state of mind," but which the Colombian regards as his duty and right to protect the national patrimony. The foreigner claims that the quinine, rubber, and coal of Colombia have suffered from unfavorable and arbitrary legislation along with oil, while the Colombian points to the case of Bolivia, where, he says, national sovereignity has been well-nigh hypothecated.

"Ever since the territory of Colombia belonged to Spain, it has been one of the canons of our law that mines containing precious metals, emeralds, and salt belong to the Nation." The Fiscal Code of October 28, 1873, Art. 1116 reads, "The Republic reserves the ownership of the mines and deposits of coal, likewise those of guano, and any other similar deposits which may be found in the public lands of the Nation, or in those which by any other distinct title may belong to it." This is the rock on which oil cooperation has foundered. His principle is a canon of Spanish colonial legislation. It figures in Mexican controversy and is a fundamental of the Venezuelan oil law. Against it we find the Anglo-Saxon, or at least the American view, which holds that the doctrine that subsoil rights belong to the Nation is un-American.

In 1913 Law 75 vested in Congress contractual rights affecting the petroleum resources of the Nation. The Colombian Supreme Court, on November 21, 1919, confirmed the ownership of subsoil rights in the owners on land of record of or previous to the Fiscal Code of 1873, and Law 120 fixed the dividing line in ownership at 1873, previous to which date subsoil rights were vested in the surface owners and after that date in the Nation. By numerous laws and regulations this arrangement was confirmed up to 1927 at which time, Law 84 — the Petroleum Emergency Law — became effective. This is a general declaration of the Nation's intent, rather than a law, to recapture the subsoil rights from the surface owners.

Proof of Title Required

On January 28, 1929, the famous regulation No. 150-1927 which is a Ministry of Industries executive order, required the oil companies to submit prior to March 5, 1928, proof of title satisfactory to the Ministry of Industries to secure a drilling permit, and the Mayor or Puerto Wilches in pursuance of instructions according to order No. 150 from Dr. Jose A. Montalvo, the then Minister of Industries, notified the drilling-superintendent of the South American Gulf Oil Company to stop drilling on the Leonard properties in his jurisdiction. In 1926 President Nel Ospina cancelled the Barco concession, which cancellation President Abadia Mendez confirmed in August, 1928. It was reconfirmed by decree of December 1, 1928.

It is important to bear in mind, however, that the petroleum law of Dr. Montalvo was an improvement on Law 19 of 1920. "El Espectador" of Bogota comments on this as follows, on July 23, 1929:

"The new law calls for three fundamental observations; first, the unwise reduction of the national reserves; second, in reference to revision of titles; and third, the inordinate size of the concessions which in Law 19 of 1920 was 15,000 hectares and in this law can be as high as 100,000 hectares." Then it comments unfavorably on the easy terms on which titles can be proved according to the new law; that is five witnesses are to testify to a year's ownership which should not prove, "El Espectador" says, anything like subsoil rights. Significantly it adds that after 1873 there are really no subsoil rights on any private property whatever, and that it is doubtful if any existed previous to 1873.

Fundamentals of Law

All this has brought about a futile impasse. It is a question of the Roman law arrayed against the Anglo-Saxon law. This situation had arisen in Mexico. One of the fundamentals of American law is, apart from the subsoil rights question, that of non-retroactivity or what is called in the American Constitution in criminal cases "ex post facto laws." The State Department of the United States enunciated this view in the Mexican case on June 7, 1921 when it declared—"If these provisions (of the Mexican oil laws) are put into effect retroactively the properties of American citizens will be confiscated on a great scale. This would constitute an international wrong of the gravest character, and this Government could not submit to its accomplishment." This view contends against Article 22 of the present Mexican constitution. In passing, and so as to bring forth again the Latin-American viewpoint, it is to be noted that the nationalization of the oil industry has been an Irigoyen government policy in Argentina, where evidently it had the support of public opinion. There is one more instance to be emphasized

while on the legal contentions of the case, and it is that in Venezuela, where legal conditions are similar to those in Colombia and Mexico, it has been found entirely satisfactory to operate a vast oil industry through American capital, under Latin subsoil rights law. This is important as indicating that, legal difficulties notwithstanding, it is possible to work together for the common good.

Finally, the foreign commission of petroleum experts in Colombia, consisting of Messrs. Holland, Cordero, Iancouslesco and Bain, laid the basis for the new oil law, which was referred to the Joint Committee of Congress on July 22, 1929, but which never became law. It appears that this commission in striving for an ideal, has drifted somewhat away from the practical necessities of the prospective Colombian oil industry and the equitable needs of foreign capital. This law again declares for the national ownership of subsoil property as expected, and confirms the validity of Executive Order No. 150. Dr. Jose A. Montalvo claimed for his bill the following:

Views of Oil Officials

"On studying attentively the general system of the bill and each one of the provisions, it is observed that not only do they tend to the development of the industry and to the bettering of the proceeds for the Nation, but also to establish, in accordance with the rights that the National constitution consecrates, a just and moderate intervention of the Government which guarantees the public good and the security of the State." At the same time representatives of the oil companies at Bogota were requested to appear before the Joint Committee to express their views.

Clarence S. T. Folsom, representing the South American Gulf Oil Company brought forth an interesting objection to Article 18 of the bill. This article provides that contracts in Colombia are subject to Colombian law; and that the foreigner must renounce diplomatic interposition in cases before a Colombian court where there has not been a denial or delay of justice. This is the well known Calvo Doctrine of international law, and is a characteristic of Latin-American law. It is part of the Venezuelan oil law, and of all legislation in Ecuador affecting foreign corporations. In both countries foreign corporations must renounce their nationality and operate as Ecuadorian or Venezuelan corporations. Mr. Folsom states that this article is "not according to international law." Let us be reminded again that in two distinct cases the US-Mexican Claims Commission ruled that foreign corporations could renounce diplomatic interposition under the conditions of the Mexican law, which are similar to those of Colombia, and these rulings become binding upon both the American and Mexican peoples. Again, Mr. Folsom is rather severe in denying the legitimacy of a person doing with his property whatever he desires, not detrimental to anyone else, in his objection to Article 46. Objection is made to the use of the word "swamps" in Article 3, Section 1, in defining the subsoil right concept of the law. Yet, any geologist will tell us that it is precisely under swamps and marshes that the possibility of finding oil is the highest. Article 5 comes under Mr. Folsom's fire, as well as Article 26, requiring the companies to furnish technical and economic information, and scientific data respectively.

Frank Feuille, representative of the Standard Oil Company of California, courteously objects to Article 10, in which the Government, he says, "reserves to itself the right to declare a contract void under terms of the law. Not only does the Government reserve the right to declare it void, but the times and conditions for declaring it. This makes the Government not only a party to the contracts, but also a court to determine the facts." With much reason he objects also to Article 41 of the Fiscal Code, which bears upon the oil law, whereby a contract with the Government is ended upon the death of the contractor.

Right of Diplomatic Action

A picturesque point is brought out against Article 18 by Samuel Haskell, of The Texas Company, in which he takes a more pertinent view of the Calvo Doctrine mentioned before. Mr. Haskell says, "It is admitted that diplomatic action is a public right and it is useless for a company or individual to renounce it, if the subject of the right or action, the State to which it or he belongs, does not renounce it." What has been said before covers the matter, but if this were true, it would *ipso facto* void the intent of a great deal of legislation in Latin-America.

This controversy, on which little progress toward a solution has been made, presents a clear case of the difficulties of overemphasizing the legal aspects of an economic question. Many of the objections to the Colombian law cover some of the general principles of law, which are sometimes different in Latin and Anglo-Saxon systems, as everyone knows. This heady strife has had some serious effects in Colombia. People there have begun to think these things over. The economic situation of the country has become critical, and the 1929 deficit amounted to $18,000,000. Meantime, on November 9, 1929, the Supreme Court declared constitutional Law 84 and the Executive Decree 150 by a vote of ten to two. Consequently, a number of prominent men in Cartagena addressed a memorandum to the Government on August 14, 1929 in which they state: "We are seeing in Colombia what has happened in Mexico and Roumania, where despite the natural wealth and expenses of installation, the great oil companies are withdrawing and turning to other countries offering better working conditions. Why is Colombia working against the practice of the oil business?" These Colombians also object to the 6-8 per cent oil royalty on private land additional to that paid by the exploiting companies, stating that such royalty is in Chile only 3 per cent. Objection is also made to the $100,000 to be posted as guarantee of fulfillment of a possibly disadvantageous contract with the Government. We must refer to the results of this same strife in Mexico where oil production in 1921 was 195 million barrels, but in 1928 was 50 million barrels on account of the nationalization policy of the Mexican government, while revenues from the oil industry dropped from $31,000,000 to $6,000,000 in the same period. It is plainly a case of not being able to eat the cake and have it also.

National State of Mind

Let us not for a moment forget that the "state of mind" of the Colombian people, in fact, of all Latin-Americans, has a historical background that was painted by President Roosevelt in the Panama Canal affair, and that much of the legislation now objected to is simply instinctive self-preservation. As M. Bellegarde of Haiti points out before the Assembly of the League of Nations on September 11, 1930: "The fear of the United States reigns in Latin-America." Fortunately, we are daily seeing signs of a better understanding and consideration between the United States and Latin-America. One of these was the speech of Charles E. Hughes at the Pan-American Conference in Havana in 1928, and another is the recent election of Enrique Olaya Herrera as president of Colombia. In this connection Ambas-

sador Davila of Chile said at Santiago, this July, that "if there are in this world enemies of imperialism, in no part are they more numerous and more resolute than in the United States."

Dr. Olaya Herrera in enumerating the three points leading to his election stated in his speech of April 21, 1930 at the Biltmore Hotel, New York, before the United Press Association, that "a working out of this better understanding (between the United States and Colombia), will result in my judgment in considerable gain to both peoples." Again, "My policy is that of the open door; that is, foreign capital must be subject to the national laws, and in the nation it must find protection in such laws, officials who will respect it, and a general favorable atmosphere." In direct reference to the oil question, Dr. Olaya Herrera said in the same speech, "Colombia is generously blessed with large petroleum resources, the exploitation of which has given rise to judicial discussions delaying the use of these vast resources. Whatever the difficulties of the case, I am of the opinion that these will be solved satisfactorily if we adopt and practice as a general principle that all legislation on the matter, to safeguard the State's rights, must give it an equitable compensation, but must at the same time assure an adequate profit to capital invested in the petroleum industry, which is so valuable to modern life."

In conclusion we must add that Dr. Olaya Herrera is now president of Colombia, and Dr. F. J. Chaux the new Minister of Industries, that a new parliamentary Joint Committee is being appointed for the purpose of enacting a new oil law. What that law will be nobody knows, but we have the assurance of the President of Colombia and of farseeing Colombian leaders that a new era of conciliation is at hand, that forgetting those things which are behind, the Colombian people and foreign capital will work together to mutual advantage and for the healing and prosperity of the economic and international relations between Latin-America and the United States, which is so much desired by men of understanding on both sides.

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Peruvian and Colombian Production

As in many other countries, production in Peru and Colombia has been tempered to the extent of cutting down on the quantity of oil taken out of the ground or expansion has been halted. Of interest in these days of curtailment are the figures just issued by the International Petroleum Company, Ltd., of its operations for the first seven months of 1930 compared with production for the same period of 1929.

PERU

	1930	1929
No. of produc'g wells completed	73	103
	Bbl.	Bbl.
Ave. initial production	406	166
Total crude production	5,989,713	6,171,081
Total crude shipments	2,861,144	2,622,642

Thirty fewer wells were brought into production this year than during the first seven months of last year; but the average initial flow per new well was 240 bbl. higher. The quantity of oil produced from all the wells in Peru was 181,368 bbl. less, the average per month being 855,673 bbl. It may be noted that the official production figures cabled to WORLD PETROLEUM by the Peruvian government give a higher production, in fact the average exceeds a million barrels per month. For instance, the Peruvian government's total for July is 1,044,470 bbl. compared with the figures of 804,594 bbl. given us by the International Petroleum Company. The apparent discrepancy is, of course, due to the production of the Lobitos Oil Co., who also operate commercially in Peru, and whose totals are not included in the Canadian company's figures.

COLOMBIA

	1930	1929
No. of produc'g wells completed	73	64
	Bbl.	Bbl.
Ave. initial production	674	789
Total crude production	11,845,348	11,718,080
Total crude shipments	11,269,939	10,583,930

Nine wells more were brought-in during the first seven months of 1930, although the average production per new well was 115 bbl. less than the wells completed during the same period last year. I. P. Co. crude production for Colombia in the first mentioned period was 127,268 bbl. higher and, but the actual shipments were 686,009 bbl. greater. Possibly local consumption during 1929 was not as much as expected, and it consequently may not have been desirable to carry the surplus in storage. This is merely a surmise.

The average production for the first seven months of this year according to the International figures, works out at 1,692,192 bbl. per month. Unfortunately the Colombian authorities have not sent WORLD PETROLEUM official figures regularly; but according to those of February, March and April, available, the average for the three months is 1,647,995 bbl.

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Wildcatting in Venezuela

PRODUCTION of 10 to 12 degree gravity oil at a depth of 6,273 ft. has just been made from the third wildcat drilled by the Société Francaise de Recherches Au Venezuela. The wildcat is located 54 kilometers from the Plaza Baralt in the district of Urdaneta or 300 kilometers from Maracaibo. It is expected that when completed, the well will average 120 bbl. per day. As the bottom of the pay sand has not yet been determined, drilling will be extended several hundred feet additional.

Two more wells will be sunk in this locality, and drilled even deeper with the hope of encountering lighter oil. As this field is located nearly 40 kilometers from the Lake Maracaibo shore, it will be necessary to lay a pipe line as soon as sufficient wells are in production. It is expected that this French company will transport and market their own production.

At a depth of 3,296 ft. a 37-degree gravity oil well has been brought in by the Richmond Petroleum Company (Standard Oil Co. of California) in the Urumaco district of Venezuela. After seven days test the well flowed at the rate of 400 bbl. per day. Redrilling is now being carried on with El Mamon No. 1, which was abandoned after it caught fire some months ago. The new well just brought in last month is El Mamon No. 5. Incidently the Richmond Petroleum Company are starting a new deep-test well at Mene Grande. It is expected that spudding will be commenced the second week in September.

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Portuguese E. Africa Wildcatting

FOLLOWING years of wildcatting operations oil sands, shallow in nature, have been reached at 2,763 ft. at Inyaminga, Portuguese East Africa. Further expenditures in deeper drilling will be made by the Inyaminga Petroleum Company, in which the African & European Investment Company, Ltd., is interested. The sands, which are impregnated with oil, are only a foot in depth, capped with a hard conglomerate and shut in below by a reddish clay bed.

Motor-Fuel Distributing Pipe Lines

Visualizing Present and Future Expansions In Transportation of Gasoline by Trunk Lines from Refineries to Thickly Populated Districts . . .

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THE distribution of gasoline through trunk pipe-lines for long distances is an important new factor in the oil business of to-day. While the active development of long-distance pipe-line movements of gasoline might have been anticipated at an earlier date due to its great economies, similar to those of crude-oil transportation via pipe line as compared with tank-car shipments, the actual development was being delayed by, until lately, insufficient consumption at inland points and also by relatively small and localized distributing organizations. The past few years in gasoline business have been noted more particularly by very large nation-wide consolidations of both distributing and marketing organizations, while the domestic consumption of gasoline in 1929 reached an amazing total of 375,000,000 bbl. In the refining end the average recovery of gasoline from crude oil is rapidly approaching 50 per cent, and hydrogenation will increase this percentage before long, while natural gasoline production increased about 26 per cent in 1929, as compared with 1928, reaching a total of 52,000,000 bbl. Therefore the production of gasoline, its consumption, and the growth of the marketing organizations in the past few years have prepared the ground for construction of an extensive distributing gasoline trunk pipe-line system to cover the inland area of United States.

ONE of the newest and most important developments in the oil industry is that of gasoline pipe-line transportation, which is calculated to have a profound effect upon the cost of distributing motor-fuel to highly-populated districts, by reducing the charges enroute from the refinery to gas-station distributing points. Because of the initial high construction expenses such undertakings will largely be limited to combinations of the big companies, which will force the smaller independents to merge with themselves or with the bigger concerns, unless the railroads in their capacity as public carriers enter into pipe-line operation, running the lines along their rights-of-way, handling gasoline from the smaller refineries in order to offset their own losses in tank-car shipments.

Gasoline Lines No Novelty

The transportation of gasoline through pipe lines is, however, not a novelty, and the pipe lines that are building to-day specifically for the long distance transportation of gasoline are benefiting by the experience gained in the past few years. The movements of gasoline through pipe lines originated in California, but affected only the transportation of natural gasoline from field plants to the refineries and to the marine loading stations, being of the gathering type exclusively. In the first six months of 1929 a total of 5,000,000 bbl. of natural gasoline was transported in California, the Los Angeles Basin "white" pipe lines of Shell, Texas, Standard of California, General Petroleum and Union Oil Companies being responsible for the greater portion of the movements. Originally but few miles long the natural gasoline lines gradually reached out to the farther field plants, at the same time their use became a standard practice in the whole west country in moving the natural gasoline from plants to the railroad loading stations. The most notable examples of long-distance natural-gasoline pipe lines are: (1) The Shell Oil Co. line from the Ventura field plant south to the company's Wilmington refinery at Los Angeles. This pipe line is four- and six-inch diameter, its total length is 97.5 miles, its carrying capacity is approximately, 3,600 bbl. per day and it was built about three years ago at an estimated cost of $1,000,000. The operating pressure of the line is 700 pounds, while the actual losses during the transport are considerably less than one per cent.

Another instance of very small losses in the transport of natural gasoline via pipe lines is the record of the Union Oil Co. in the Los Angeles Basin, where that company handles about 9,600 bbl. daily with a loss of but one-half of one per cent. (2) The Union Oil Co. built in the beginning of 1930 a 6-inch welded line, 88 miles long, from the Kettleman Hills field to tidewater at Avila in San Luis Obispo county. It is estimated that this line cost $700,000. This line has been in operation for several months at this date; and (3) The Canadian River Gas Co. of Texas Panhandle is operating a 30 mile two-inch welded pipe line to transport the natural gasoline manufactured at its Bivins Station plant to the railroad at Amarillo. The three lines indicated above are filling somewhat different requirements, though in every instance the natural gasoline is transported to be further treated at refineries, whence it finds its way to the markets through the regular channels.

Future Expansions and Reasons

With the experience gained from operating the natural gasoline lines, as well as trunk crude-oil lines, and after careful analysis of distributing and marketing of gasoline, a number of factors relating to such future gasoline distributing lines have been generally accepted as likely to apply, until actual operating conditions alter the present

interpretations. The more important factors grouped under major classifications are as follows:

I. Factors Favoring the Development.

1. Large increases in the volume of consumption of gasoline.

2. Large increases in recovery of gasoline from a barrel of crude oil, now approaching 50 per cent on the average, and in a few instances reaching 60 per cent, and with higher percentages in sight.

2A. Future development of the hydrogenation process, which will further increases the recovery of gasoline to a figure approximating 100 per cent, and in more distant future to a possible 125 per cent, or even higher.

3. Growth of nation-wide distributing and marketing organizations.

4. Cheaper transportation costs. Over long distances estimated at 25 to 35 per cent of the tank car shipments and somewhat higher over shorter routes.

5. Smaller evaporation losses, as compared with tank car shipments, since trunk lines are practically closed systems.

6. Whereas crude oil has to be moved from the oil fields to distant refineries, and then its products in many instances transported back to the markets, the gasoline manufactured in refineries strategically located within oil producing areas can be transported without virtually doubling in its own tracks.

7. Whereas trunk crude-oil line has a maximum capacity at its terminal, thus necessitating equally large diameters and heavy equipment along the entire route, the gasoline trunk line has its maximum carrying capacity at its source, and as the traversed territory absorbs a certain volume of the runs, with the distance the pipe line may either reduce the diameter of the pipe and the size of the pumps and their power, or increase the distance between its pumping stations (or all three), thus reducing very considerably the capital investment per mile.

8. Whereas a crude-oil line under present conditions transports at the very best but 50 per cent of motor-fuel, a gasoline line doubles the usefulness of the carrier, if motor-fuel alone is considered. The refineries located at sea, or lake, ports, and able to reach vast marketing territory by means of cheap tanker shipments, are not affected by the above consideration and will continue to further develop the crude-oil trunk systems in line with the increases in consumption of petroleum products on the world's markets. Thus the locations of the country's principal refining centers will not be affected by the development of trunk gasoline lines.

9. The gasoline distribution by pipe lines will tend to increase the capacities of old refineries within producing areas, and also will stimulate the construction of new units, partly due to the availability of cheap natural gas supply for fuel, and partly to the ever increasing production of natural gasoline in the oil fields, this production therefore not requiring expensive tank car shipments to distant refining points.

II. Factors Retarding Development.

1. Very large initial investment involved; but very few of the larger companies being able to afford trunk line construction. An important development in this connection is the co-operative ownership, as exemplified by the new Great Lakes Pipe Line Co., owned together by the Continental, Barnsdall, Pure Oil, Phillips, and Mid-Continent companies.

2. Inability of trunk gasoline lines to transport but relatively large batches of each grade or trade mark; estimated minimums varying between 50,000 and 100,000 bbl., thus limiting the use to the largest producers and distributors.

3. Opposition of various organizations and groups, more particularly that of railroads, which stand to lose considerable amount of motor-fuel traffic, a very large factor in freight transportation.

III. Factors of Principal Types.

1. Specially built long-distance trunk gasoline pipe-lines tapping large sales areas, and following closely main highway arteries. Diameters, eight to ten inches. Capacities, 15,000 to 30,000 bbl. per day. Type being developed most actively at this time. These lines plan to have bulk distributing stations at 50 mile intervals to take care of the requirements of an estimated 100-mile belt along the right of way.

1A. Converted trunk crude-oil lines. Sizes and capacities as in 1A.

2. Small diameter, two- to four-inch pipe lines connecting either the refineries, or the points along the trunk lines, with the localized consumption centers. Capacity 500 to 2,500 bbl. per day, average distance estimated at 75 miles.

3. Practically all trunk crude-oil pipe lines building now, or planned, are anticipating in their plans the possibility of conversion, and will therefore become important potential gasoline carriers.

IV. Factors of Terminals.

1. Terminals at points of very large local consumption.

2. Terminals at points from which cheap river or lake transportation is available, thus extending the distributing territory.

3. Terminals at points from which advantageous tank car shipments can be made.

V. Factors of Auxiliary Transport.

1. Heavy truck tanks serving an area approximately 100 miles in diameter:—from bulk stations along the route, from the terminals, river stations, etc.

2. Tank car shipments whenever advantageous.

3. River, canal, and lake tankers and barges. Latest types of Diesel-driven inland river and canal tankers carry as much as 6,000 bbl. In United States the greatest water route is the Mississippi River and its tributaries. A most interesting development at this time is the rejuvenation of the interior river transport; its economic advantages were first realized and utilized by the steel industry of the Pittsburgh district, the oil industry profiting by this experience. A considerable number of tankers are now operating through the New York State canal, a transportation started by the Standard Oil Company of New York seven or eight years ago.

VI. Factors of Construction.

1. In practice, laying either a gasoline or a crude-oil trunk pipe-line is similar. The more important differences are: (a) a gasoline line need not consider the cold temperature factor in burying the line. (b) the carrying capacity of a gasoline line is approximately 35 per cent greater than that of a crude-oil line, other factors being equal. (c) floating-roof elevated surge-tanks are used at pumping stations of gasoline lines to keep a pressure of between 6 and 30 pounds per square inch on the suction of the pumps, and also to collect any gases or air that may come into stations.

2. Present tendency is to equip pumping stations with Diesel engines and reciprocating pumps of special design. The choice of either Diesel or electricity depends upon local conditions, rates, etc., and upon the views of oil company engineering executives. Furthermore,

sales pressure exerted by the big power companies and by Diesel engine manufacturers, who are strenuous competitors, have their influence. The one that makes the best case or makes the greatest efforts usually wins the decision as to type of power. The Phillips Petroleum Company, which has a large natural gas supply in Texas Panhandle, will use gas engines and centrifugal pumps, the gas (butane) being transported through the gasoline line simultaneously with the gasoline.

3. Storage along the route and at the terminals consists of floating roof tanks in the case of gasoline pipe lines.

VII. Factors Preventing Building Feeder Gasoline Lines to Individual Filling Stations.

1. Whereas the gas distributing lines to homes have a pressure of but 6 oz., the gasoline lines will require considerably greater pressures, with resulting much more expensive lines and higher maintainance cost, probably prohibitive factors.

2. As direct result of the higher pressure, the fire hazard may be considered by the municipalities to be sufficient cause for prohibiting such lines in thickly populated areas.

3. The truck-tank service can be considered as well developed and economical, provided the trucking distance does not exceed about 50 miles, especially as many gas stations are small or isolated and could not be fed economically.

A table of the trunk motor-fuel distributing lines in operation or building at this time in United States is given on page 445.

The pipe lines indicated on the attached table represent a total motor-fuel, plus crudes, carrying capacity equal to about 90,000 bbl. per day to be reached when the Great Lakes Pipe Line Co., the Phillips Petroleum Co. and the Susquehanna Pipe Line Co. carriers are completed. This represents approximately eight per cent of the total daily consumption of gasoline in United States, indicating the importance of this method of transportation even at this early stage of development of trunk gasoline lines.

Results of Gasoline Lines

The following effects may be anticipated as the result of extensive building of gasoline distributing lines:

1. Further growth of large nation-wide producing, distributing and marketing companies, because smaller companies will not be in position to compete with well-integrated concerns who have their supply available through considerably cheaper medium of transport.

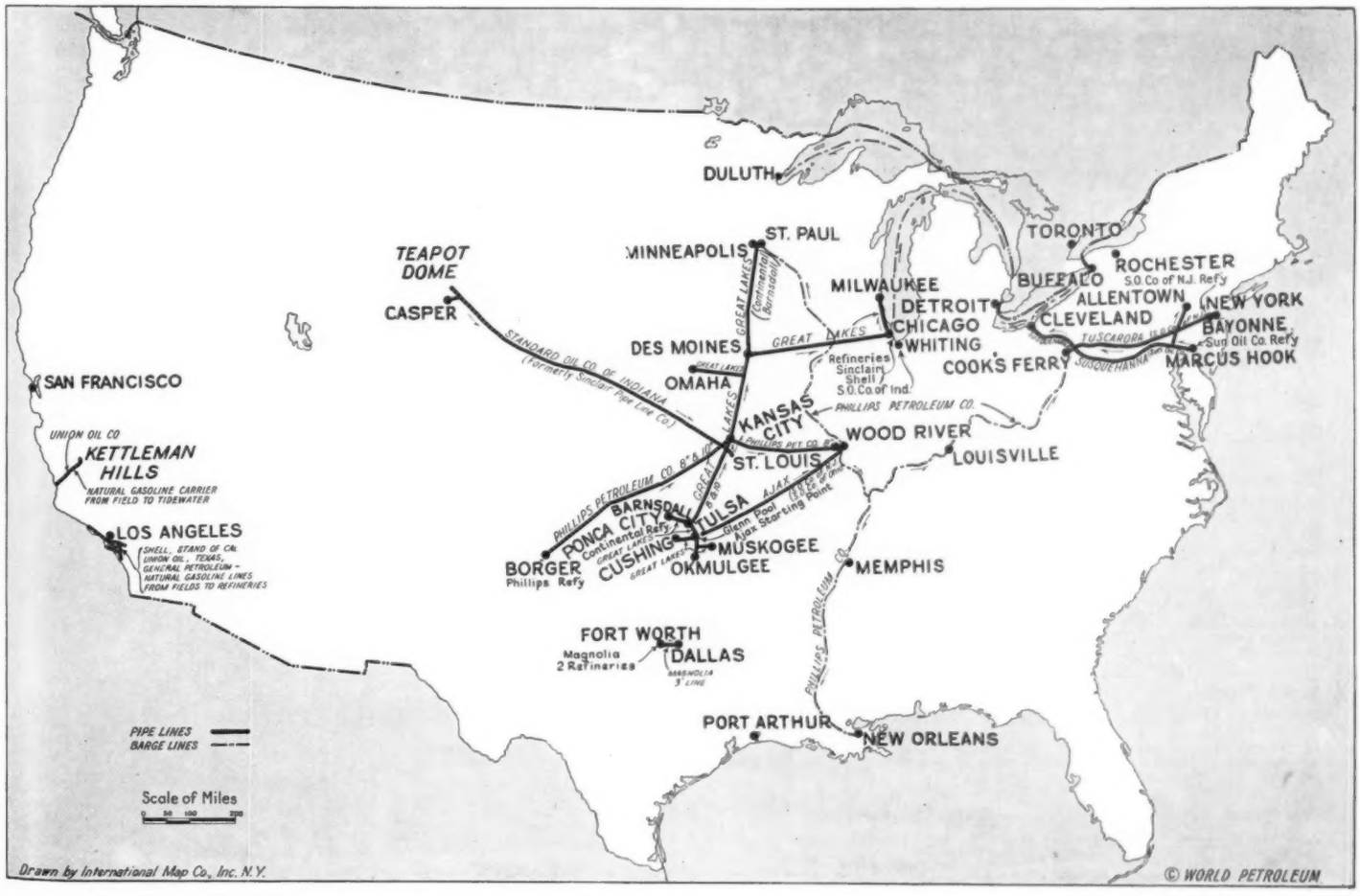
2. Increased margin of profit per gallon for companies operating the gasoline trunk lines.

3. The refineries situated within oil producing areas reached by trunk gasoline lines will show considerable increase in capacities, more particularly due to installation of additional cracking stills, and in future the hydrogenation plants may be built in heavy oil districts to augment, or even supplant, existing refineries.

4. The railroads moving motor-fuel will show decreased earnings, though such reduction will be very gradual and in some instances may be compensated by other freight, unless the railroads as common carriers participate in pipe-line construction and ownership.

5. The tank-car leasing companies will apparently lose most, as they are affected directly, and do not have any substitute freight. Union Tank Car Co. and the General American Tank Car Co. are typical tank-car companies leasing cars to oil companies. At this time there are about 275,000 tank cars in operation.

6. Competition of outlying oil producing districts may be anticipated in well-established marketing zones. Thus the Mid-Continent gasoline will enter Chicago, New Orleans, St. Paul and possibly Pittsburgh districts, while Wyoming may successfully compete in Kansas City and Chicago districts. Such competition may temporarily upset the present



Recent gasoline pipe line developments in the United States.

balance, but in the long run will tend to stabilize the gasoline marketing.

7. The growth of gasoline lines will provide considerable amount of business for fuel and pipe line companies, and incidentally furnish much employment.

8. Possible slight reduction in filling station quotations in areas entered by trunk lines.

Rapid Development Probable

Summing up it may be definitely concluded that the pipe line distribution of motor-fuel offers many advantages over tank-car shipments, and that accordingly the next few years will see rapid development of trunk gasoline pipe-lines, followed by shorter feeder lines to minor centers of consumption. Companies like Shell, Texas, and Sinclair, as well as others, will not be able to afford to continue expensive tank car shipments, and will be forced to build gasoline trunk pipe-lines, or convert their older carriers for transportation of gasoline. It may mean the merger of many more smaller independent companies with the more powerful organizations.

Gasoline Distributing Lines in Europe

The development of gasoline trunk pipe-lines in Western Europe is possible, but unlikely. The consumption of gasoline is relatively small, but more importantly the water routes are excellently developed, reaching far inland. Also most of the railroads in Europe are either owned or heavily subsidized by the Governments, and the construction of trunk gasoline lines reducing the traffic will be vigorously, and probably successfully, opposed.

In Russia, however, the conditions are most favorable for the development of gasoline trunk lines. The actual construction will most likely allow transportation of both gasoline and kerosene, since the home consumption of gasoline would certainly not warrant the building of lines at this time. The notable inefficiency of Russian railroads, small capacity of tank cars and the inability of the railroads to carry heavier cars, are the factors necessitating pipe-line construction, which in turn will lighten the railroad traffic, burdened now by the rapid industrialization of the country. Also very cold winters of Central and Northern Russia complicate the construction of crude-oil lines, while gasoline and kerosene lines would not be affected at all by temperatures below zero.

Russia at this time has one kerosene export trunk pipe line from Baku to Batum (on the Black Sea), completed in 1905 and in operation ever since. This line was built by the Government to release the Trans-Caucasian Railroad from excess traffic. It is an eight-inch line, approximately 535 miles long, with a carrying capacity of about 8,000,000 bbl. per year.

The new lines, if constructed, will connect the oil fields and refineries of Baku, Grozny and Maikop with agricultural and industrial centers of Russia. Districts likely to be served first by gasoline and kerosene lines include the Moscow Industrial Center, with further extension to Leningrad, and the Southern Russia agricultural and industrial areas. The first line would start on the Caspian Sea and go to Moscow via Stalingrad, Tambov and Riasan, a total distance of about 1,100 miles, while the second beginning at Grozny or Maikop would reach Kieff, via Rostov, Stalin in the Don Coal Basin, and Dniepropetrovsk, a total distance of about 750 miles.

[According to the official U. S. S. R. report in the September issue of WORLD PETROLEUM, a gasoline-kerosene pipe line is already planned to run from Grozny-Ukrainia.—EDITOR.]

Pipe Line Co.	Subsidiary of	Starting Point	Destination and Route	Diameter of Pipe	Mileage	Capacity Bbl. Daily	Refineries Supplying Gasoline: Location	Company	Capacity bbl./day (crude)
Specially Built Long Distance Carriers									
Great Lakes Pipe Line Co. (Building)	Continental Oil Co. Barnsdall Oil Co. Mid-Continent Petr. Co. Pure Oil Co. Phillips Pipe Line Co.	Tulsa District	Kansas City Omaha (branch) Des Moines St. Paul Chicago Milwaukee (branch)	8" & 10"	1,350	30,000	Ponca City Sapulpa Okmulgee Barnsdall	Continental Oil Co. Continental Oil Co. Barnsdall Oil Co. Barnsdall Oil Co.	30,000 10,000 11,000 5,000
REMARKS—This line is built primarily to serve the indicated refineries, but in the future other refineries and distributors may be connected. The more important of those are: The Mid-Continent refinery in Tulsa with 40,000 bbl. capacity, the Phillips Petr. Co. (former Independent Oil & Gas Co.) refinery in Okmulgee with 5,000 bbl. capacity and the Deep Rock Co. refinery in Cushing with 10,000 bbl. capacity.									
Phillips Petroleum Co. (Building)	Phillips Petroleum Co.	Texas Panhandle	Wichita, Kansas Kansas City St. Louis, Mo.	8" & 10"	800	25,000	Borger	Phillips Petr. Co.	15,000
REMARKS—The present refining capacity of the Borger refinery is to be increased immediately to 20,000 or 25,000 bbl. per day. The Phillips Petr. Co. also operates several natural gasoline plants in Texas Panhandle with combined daily capacity of about 8,500 bbl. The Phillips Petr. Co. plans to use extensively the Mississippi River system, barging gasoline to St. Paul, New Orleans and via Ohio River to Louisville and Pittsburgh.									
Susquehanna Pipe Line Co. (Building)	Sun Oil Co.	Marcus Hook, Pa.	Columbia Allentown (branch) Pittsburgh Akron, Ohio Cleveland	6" & 8"	500	15,000	Marcus Hook, Penna.	Sun Oil Co.	35,000
REMARKS—By reaching Cleveland the Sun Oil Co. may extend its cheap routing to other Great Lake points by tankers and barges. This line is also near the Ohio River and consequently, if found advisable, can barge gasoline West.									
Converted Trunk Crude Oil Lines									
Tuscarora Pipe Line Co. (Converted and Operating)	Standard Oil of N. J.	Bayonne, N. J.	Cooks Ferry (on Ohio River)	10"	400	25,000	Bayonne, N. J. Linden, N. J.	Standard Oil of N. J. Standard Oil of N. J.	88,000 75,000
REMARKS—Standard Oil of N. J. was the first company to distribute motor fuel by pipe line, this line being the first experiment. This line terminates on Ohio River, therefore barging West is possible.									
Standard Oil of Indiana (Conversion Considered)	Standard Oil of Indiana	Casper, Wyoming	Freeman, Kansas	8" & 10"	720	20,000	Casper, Wy.	Midwest Ref. Co.	50,000
REMARKS—This line was formerly owned by the Sinclair Pipe Line Co. The planned extensions from Freeman, Kansas, include those to Chicago and Kansas City. The conversion of this crude line is only considered at this time. Also under consideration is the erection of Hydrogenation plants at Casper to treat heavy Rocky Mountain Oils.									
Small Diameter Short Lines									
Magnolia Petroleum Co. (Operating)	Magnolia Petr. Co.	Fort Worth, Tex.	Dallas, Texas	3"	28	2,000	Fort Worth	Magnolia Petr. Co.	10,000 (two ref's)
REMARKS—This is the only short distributing line built so far. None are planned at this time, but the development of this type of gasoline lines should be very rapid. Their cost is small, and time required in building is measured by weeks.									
New Trunk Crude Oil Lines, Potential Gasoline Carriers.									
Ajax Pipe Line Co. (Building)	Standard Oil of N. J. Standard Oil of Ohio	Glenn Pool, Okla.	Wood River, Ill.	two 10"	450	65,000	Tulsa Area	Several	
REMARKS—This pipe line is being built primarily for handling crude oil, and only in the future one-half of it may be used to move gasoline. The construction anticipates such change.									

Fighting of Oil Fires with Water

Santa Fe Springs has Disproved the Theory That Water Aids, Rather Than Destroys Petroleum Fires, by Use of Fog Equipment

By Glenn G. Griswold

Captain, Los Angeles County Fire Department
Santa Fe Springs Fire Protection District

WHEN one of the first "wild wells" caught fire during the early boom period at Santa Fe Springs, California, the experience is memorable, for while the flames roared several hundred men rushed about attempting to quench the blazing heat. Most of their efforts were practically useless, because they knew of no process or method to extinguish the great oil fire. Again in Roumania there is a well that has been burning for over a year, resisting all attempts to put it out.

Just such a condition as the foregoing led to the development of one of the most unusual fire protection districts in the world. This was in the latter part of 1924, in a fire protection district that did away with convention and based its organization on the knowledge of experience. This fire protection district, or organization, was composed of twenty-eight fire Protection Districts, the third largest fire fighting unit on the Pacific Coast, covering an area of 184 square miles with a total assessed valuation of $170,685,258. Of these twenty-eight districts, one was that of Santa Fe Springs. It is this in which we are interested for through its actions and policies, new fire protection and fighting history has been made.

Santa Fe Springs being so situated that its major fire hazards were confined to oil and its by-products, naturally chose those methods which it deemed most useful in the fighting and control of fires of the mentioned types. Of these there are four of the major importance, the first being the establishment of a metropolitan, efficient fire-fighting organization in an unincorporated territory where the latest fire-fighting equipment could be used with fully paid, uniformed men to handle the same. The second was the placing of pneumatic tires on heavy fire-fighting apparatus instead of hard rubber tires; the third the establishment of an alarm system, approved by the Board of Underwriters, and fourth, the use of water exclusively (with the exception of small carbontetrachloride extinguishers) for all types of fires, including the burning surfaces of oil and its by-products. All chemical tanks on triply combination fire apparatus were changed to water tanks, creating pressure by use of pumps on the apparatus.

Opening water valve to distributor head in tank.

Crude of 35 gravity burning prior to turning on water extinguishing system.

A New Water Method

Of the four foregoing, the fourth is the most important to oil companies, inasmuch as it explains a method of extinguishing oil fires that is without precedent. Furthermore, is of interest because it drew considerable criticism from various individuals perhaps not familiar with the basic principles of oil-fire fighting, a criticism that had to be lived down by actual performance. By performance I mean this:

Sometime after the establishment of the district, one of the oil companies operating in the Santa Fe Springs area unexpectedly drove into a high-pressure gas sand. The result was a "blow-out" and a highly dangerous fire. The Santa Fe Springs fire company was immediately called into action. All that could be done was to take care of the exposures surrounding the well, for the radiation from the heat created would ignite wooden derricks several hundred feet distant and there were eight or ten such derricks in close proximity to the burning well. Several wooden derricks could not be saved and were pulled down because they were not equipped with spray systems. All derricks equipped with sprinklers were saved, one being within seventy-five feet of the blazing torch.

Hundreds of the employees of the oil companies were put to work cleaning up the debris caused by the falling derricks, these men enduring a great amount of punishment. More water lines were piped to the scene of the fire from great distances by the workmen, the county fire apparatus pumping the water to the derrick sprays and to hose lines playing on the burning oil on the street (the burning oil on the street was due to the well not burning all the oil at its base and consequently flooding a street). The nozzles used to keep the burning oil under control were specially designed to deliver a dense, heavy fog. A water-operated system, using fog distributors fashioned after the fog nozzles, were installed around the well. After this, no fire escaped from the fog protected area, the oil was allowed to flow into a sump and pumped away by pumps. This pro-

Ten seconds after opening valve, flames are almost out and steam is rising.

cedure kept the fire completely under control, and after sometime a tunnel was dug to the casing of the well, and the pressure relieved on the valves of the Christmas tree. The fog nozzled hose lines were then brought into play and the fire on the well extinguished and the valves—which had been kept cool by the fog—were easily turned and the oil flow diverted through pipe lines in the tunnel.

Particular Local Conditions

It would have been possible to have extinguished this fire as soon as it was brought under control, but to have done so would have meant increased hazards from flying gas and oil in this congested district, so under the existing conditions the less hazardous methods were followed.

The outstanding fact about the foregoing illustration is that it proved for once and all that water, properly applied in the form of fog, will extinguish the most vicious of oil fires. Also it proved that oil derricks, or other structures of this type, when protected by spray systems can stand intense heat without igniting. More than this, it proved that water, when accessible is the, least expensive and one of the most efficient means of fighting fires that is known today.

It is interesting to note the development of the fighting of oil fires of the nature mentioned with water for on it is based the fundamentals of water-operated fire equipment. History tells us that fire has always been one of two things: man's best friend or his worst enemy. Science tells us that the action called fire is a form of combustion in whch oxygen is one of the combining substances and that materials which burn readily are called combustible bodies. Also, the same source tells us that it is necessary to heat the combustible substance in contact with oxygen or air to its kindling temperature in order to start a burning (fire) action, and if sufficient heat is set free, the burning will continue until all the combustible bodies are used or the fire extinguished.

How Fires Are Extinguished

There are two ways of extinguishing fires: (1) To cool the burning material below its kindling or ignition point, and (2) To smother fire by excluding oxygen. (Also, fires may be controlled by removing the combustible material from the path of the fire.)

Examples can be cited where each of these methods is utilized to the practical exclusion of the others. However, any type of equipment designed primarily for extinguishing fire, using one method, will of necessity operate at a great disadvantage on a fire that requires another method or a combination of both methods to extinguish. Water broken up into the form of a fog of minute water particles will cool the fire by the absorption of heat and smother by the displacement

Water fog nozzle

of oxygen. In the process of absorbing heat, steam is generated in the space between the fire and burning material, thereby excluding oxygen. Water placed on a fire in this manner is highly efficient because its cooling effect is multiplied by the heat absorbed when water is changed to steam and its volume is multiplied approximately 1,700 times, thereby displacing oxygen, as the change takes place. This is why water in the form of fog is an effective fire fighting agent. Every characteristic of water favors its success.

The First Method

Water in one form or another has always been, and will continue to be, widely used for controlling fires of all types. With the introduction of the fog system, the usefulness of water as a fire fighting agent will greatly increase, as the fog system eliminated former objectionable features, and because of the fact that water is the original, most economical, most accessible and everlasting enemy of fire.

Los Angeles fire officials examining fog spraying nozzle

Water and fire being natural enemies, it is the equipment that distributes water most effectively that will extinguish fire the quickest. A gallon of water applied efficiently will do more good than 1,000 gallons of water distributed inefficiently.

It's Complete Coverage that Counts

It is a well-known fact that water absorbs heat from fire. It is also known that only the outside surface of water is in contact with the fire or the heated material. Therefore, the efficiency of water as a heat absorbing agent depends solely upon the amount of surface area exposed. That is, water applied to fire in perfect fog-particle form, will extinguished a fire immediately because the whole burning area is exposed to heat-absorbing fog particles. This means that the efficiency of solid water streams (or other fluids) is low for only the outside surface of the stream in contacting the fire. In other words, a stream of water shooting into a burning oil tank will extinguish only that area which it hits, whereas if this gallonage was applied as a fog, it will extinguish the fire at once because the fire would be absorbed by the water, regardless of the fire's location. This is due to the fact that the fog penetrates all cracks and crevices to reach the burning area.

When a solid stream of water (or other fluids) disturbs the surface of burning oil it causes the oil to atomize, thereby exposing more oil surface to the fire and increasing its intensity. The fog does not disturb the surface of the oil and thus this hazardous practice of long standing is eliminated in its entirety.

Efficiency by Division

Assume that a gallon of water in the form of a solid stream is broken up into cubic inches and the cubic inches are in contact with the flames on all sides, you will have an effective ratio of 1 to 10,368. However, if a fog distributor is used, this hypothetical cubic foot of water will be broken into thousands of particles with a corresponding greater increase in effectiveness.

In other words, every time the water is divided, its effectiveness is multiplied.

Water turned into fog kills fires at their source by an ultra-concentrated cooling of the complete burning area, and by displacement of oxygen. Fog does not cause boilovers of burning tanks or other fluids, because the water is changed into steam on the surface of the burning oil; it is inexpensive and immediately obtainable from any water main, does not require any upkeep or depend on gaseous or acidic conditions for operating efficiency and is therefore perpetually efficient.

In discussing the conquering of the well fire, the term distributor may be used, these distributors being installed around the burning well. In detail, it is simply a device designated to break water into minute fog particles, i.e., a flow of ½ gallon per second passing through it will be converted into a fog covering 180 square feet in an un-confined area. In a confined area, this efficiency ratio is much greater. Water converted into a fog such as that described has an extremely large outside surface and will absorb heat instantaneously. In this action the fog is converted into steam, this eliminating water damage. When an oil tank equipped with these fog distributors catches fire, no boil-over occurs. A tank containing crude, gasoline or any other petroleum products, will be extinguishes in a few seconds, provides every 180 square feet is protected with a fog distributor. Refineries can also be protected from fire with this system, using either automatic or manual operation principle.

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U. S. S. Russia Oil Production

DETAILED figures for Russian production in June of this year are now to hand. The daily average crude-oil production in U. S. S. R. during June amounted to 347,900 bbl., which is below the daily average for May but above the figure for April.

The total of crude production for June amounted to 10,437,480 bbl. (7 bbl. = 1 ton) and was derived from the various fields, as follows:

	June 1930 Bbl.	May 1930 Bbl.	June 1929 Bbl.
Azneft	6,496,154	6,496,245	5,444,901
Groznett	3,701,313	4,178,118	2,618,973
Embaneft	202 930	219,597	178,486
Uralneft	7,546	4,830	.....
Ezbekneft	29,897	33,215	11,795
	10,437,840	10,932,005	8,254,855

The increase in production in June, 1930 against June, 1929 amounts to 26.4 per cent. The total quantity of crude-oil run to stills during June, 1930 amounted to 9,158,527 bbl., and compares with the figures for May, 1930 and June, 1929 as follows:

	June 1930 Bbl.	May 1930 Bbl.	June 1929 Bbl.
Azneft	5,161,667	5,359,926	4,062,429
Groznett	3,774,460	3,702,643	2,480,926
Refineries in the interior	222,460	141,582	80,087
	9,158,527	9,202,151	6,623,442

The following table shows exports for June, 1930 in comparison with the figures for May, 1930 and June, 1929.

	June 1930 Bbl.	May 1930 Bbl.	June 1929 Bbl.
Light Grozni Gasoline	233,100	307,300	119,700
Heavy Grozni Gasoline	427,700	411,600	416,500
Bacou Gasoline	277,900	288,400	207,200
Ligroin	.....	47,600	.....
Kerosene	242,620	518,700	294,420
Lube, Oil	110,880	142,800	158,480
Solar Oil	34,300	35,000	53,200
Diesel Oil	700	1,400	.....
Gasoil	134,400	438,900	124,600
Fuel Oil	787,500	1,078,700	837,200
Crude Oil	88,900	125,300	137,900
Other Oils	18,900	21,700	20,300
	2,356,900	3,417,400	2,369,500

The larger table shows the totals, consisting of internal consumption and exports for June, 1930, in comparison with June, 1929.

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American Refinery Combination in France.

A $10,000,000 REFINERY and dock is planned for Rouen, France, by the Franco-American Refining Company, which is formed by a group including the Standard Oil of N. J., the Gulf Oil Corporation and the Atlantic Refining Company. Gulf will, it is reported supply the crude from Venezuela, the Atlantic Co. will handle the refining end, while Standard Oil will distribute the products. A French concern may join the combine, but the Standard Oil interests will dominate.

	June, 1930			June, 1929		
	Internal Consumption (Bbl.)	Export (Bbl.)	Total (Bbl.)	Internal Consumption (Bbl.)	Export (Bbl.)	Total (Bbl.)
Gasoline and Logroin	197,148	938,700	1,135,848	86,366	743,400	829,766
Kerosene	1,009,827	242,620	1,252,447	666,533	294,420	960,953
Diesel and Gasoil	499,317	154,000	653,317	363,895	144,900	508,795
Heavy Lube Oils	153,664	.....	153,664	156,751	.....	156,751
All other Oils	254,807	110,880	365,587	176,631	158,480	335,111
Fuel Oil	3,846,829	787,500	4,634,329	2,947,924	837,200	3,785,124
Solar Oil	.....	34,300	34,300	.....	53,200	53,200
Crude and Others	.....	88,900	88,900	.....	137,900	137,900
Totals	5,961 592	2,356,900	8,318,492	4,398,100	2,369,500	6,767,600

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H. S. BELL

CONSULTING PETROLEUM ENGINEER

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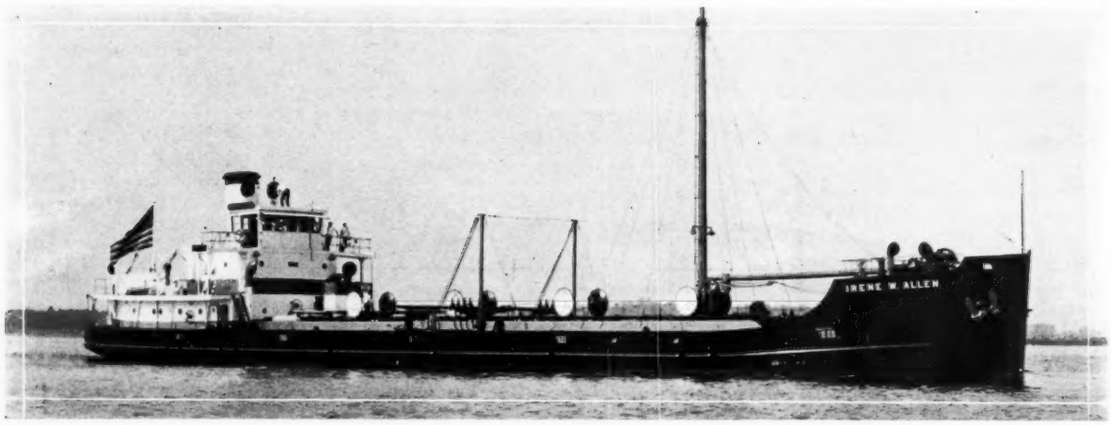

BRACKETLESS

UP to July no fewer than 974 tankers aggregating 9,173'680 tons dwc had been built, or were building, to the Isherwood and Bracketless systems of hull construction for world-wide and local transportation of oils. Of these 115 vessels, representing 1,098,405 tons dwc, are built to the Bracketless system.

The vessel illustrated above is the "Bracketless" motorship "Irene W. Allen", which was lately built by the Bethlehem Shipbuilding Corporation at their Sparrows Point Plant for the Lake Tankers Corporation.

For oil tankship construction the "Bracketless system" eliminates bulkhead brackets—eliminates bulkhead leakage—greatly simplifies construction—greatly reduces cost of upkeep, and cost of damage repairs. Substantially increases the longitudinal strength beyond the well-tried "Isherwood system."

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